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By Lawrence H. Singer

Promising Plastic — When the new Glenn L. Martin plastic plant gets in production next fall it will have an ultimate annual capacity of 11,000,000-lbs. of Marvinol resin. An exciting future has been predicted for this chemical development of the big Baltimore airplane organization.

Marvinol can be used for colored wire insulation, transparent garden hose, woven fabrics and numerous other items. Leather-like resin-coated fabrics have already been perfected for wall and floor coverings, as well as for seat and lounge upholstery, on the new Martin airliners.

The Glenn L. Martin Co. is careful to point out that the new Cleveland plant will manufacture only the raw materials. However, it is confidently expected that Marvinol will enter the fields of industry now using rubber, metals and wood.

* * *

Inflation Dilemma — Since general price control cannot be permanent, declares Dr. Albert G. Hart, of the Committee for Economic Development, monetary and fiscal policy must be ready to take over the responsibility of inflation control by early 1947. This well-known expert is currently serving as an economist in the research division of the CED.

In Dr. Hart's estimation, our dilemma is that a policy committed to strengthening work and demand, whenever unemployment became serious, would be in danger of generating inflation. On the other hand, he adds, such a policy committed to anti-inflationary action whenever prices rose appreciably would be in danger of generating unemployment.

"The dilemma," summarizes Dr. Hart, "hinges chiefly in the danger of inflation with driving power from the cost side."

* * *

New Auto Entry — Another bid for the low-priced car market is being made by Crosley Motors, with a radically new midget vehicle. Built with an aluminum turret-topped body, the machine will carry four passengers at a top speed of 60 miles an hour, going 50 miles on a gallon of gas.

The new Crosley weighs only 1000-lbs., which is about one-third the weight of a Ford V-8. Perhaps the most startling feature of the car is the light 4-cylinder engine, which tips the scales at 58-lbs.

Crosley expects to turn out at least 25,000 units this year. Unless another surprise starter is entered in the automobile sales fracas, the lightweight Crosley should be America's lowest priced automobile.

* * *

Featherweight Houses—The latest wrinkle in building construction is a "featherweight" house that can be erected in a single day by

(Continued on page 9)

15 mechanics. Designed by Henry C. Carney, a New York Industrial designer, it is fashioned entirely of corrugated plywood, drawing its inspiration from airplane fabrication.

Although the structural sections are only about one-fourth as heavy as ordinary plywood, they are reported to be extremely sturdy and durable. Similar techniques were used for the floors of some war planes. Each section of a Carney house is designed to be joined by a special locking device.

A standard Carney section—with built-in kitchen equipment, bookshelves, heating unit, etc.—could be transported to the building site in a truck and secured to concrete posts set in the ground. Through mass production, the designer believes it might be possible to produce a home in the $4000 class which would compare favorably with more expensive structures.

* * *

Air Conditioning Prospects — As an indication of the huge amount of money that has been allotted for air conditioning installations, consider this tricking fact: *Chain Store Age* forecasts that America's chain stores alone are ready to spend over $20,000,000 for such purposes in 1946.

The encouraging estimate is based on information obtained from organizations operating over 18,000 stores in all industries. Jewelry stores lead the parade of businesses eager to install air conditioning equipment, with apparel chains second in this category.

* * *

Far Eastern Markets — China's purchases from abroad in the next few years will consist largely of capital goods, says Dr. Chih Tsang, director of Shanghai Commercial

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Trading Bank. Dr. Tsang visited North America recently on an industrial mission. He points out that supplies for heavy industry are at the top of his country's requirements.

China will provide an excellent market for American second-hand machinery and tools, declares this official, as well as scrap iron, steel and used railway equipment. Such exports on our part, he adds, will help the United States to install more efficient industrial installations for our own manufacturing needs. In addition to government credits, adds Dr. Tsang, his country will welcome funds from private channels in the form of long-term foreign investments, as well as installment credits from manufacturers.

* * *

New Dishwasher — Not content with his forthcoming line of autos and farm machinery, Mr. Henry J. Kaiser will soon be marketing a revolutionary type of dishwasher. Described as a "jet-propelled" appliance, the machine weighs only 50 lbs., is made of an aluminum alloy, and contains no motor.

The Kaiser washer will have a relatively small capacity, and will require moderately hot water for proper operation. The big eye-opener, however, is the fact that it may sell at little more than $50.

* * *

Petroleum Research—Many of us are wondering about the future of the oil industry in the fast-approaching atomic age. Part of the answer will be disclosed during the next few years in the great new petroleum research buildings which are soon to be constructed by the Socony-Vacuum Oil Co. in Paulsboro, N. J.

Although the research center

(Continued on page 114)

Long a topic of vital concern to all finishing executives, this parts-cleaning process solves many production problems. Its chief types, features and uses are concisely presented here.

BEFORE . . .
Dipping an oil-coated wrench into solvent vapor of degreaser. Solvent vapors condense on cold metal, thus causing oil to dissolve and run off.

Metal Cleaning by Solvent Degreasing

BY S. J. TREZAC

SOLVENT degreasing which means the removal of grease, oil and oily dirt from metal surfaces by controlled solvent action, is being used by an increasing number of concerns to prepare metal parts and products for painting.

Having clearly proved itself through both war and peace as a versatile, high-speed, oil dissolving and grease-removing process that meets the requirements of efficiency and economy in handling many different parts-clean jobs on a mass-output basis, solvent degreasing promises to play a role of even greater importance in postwar production lines.

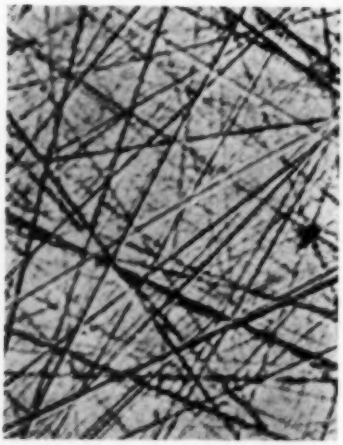
Now, as the kinks incident to reconversion are being ironed out and peacetime production is about

AFTER . . .
Here you have same wrench less than a minute later. It is being removed thoroughly clean and perfectly dry. (Detrex Corporation photographs.)

to proceed, a discussion of solvent degreasing—what it is, how it works, what it does; its four principal types, their applications, their merits—should be welcome by anyone responsible for product cleaning and painting operations.

A Simple Process for Cleaning Metal

Basically, solvent degreasing is a remarkably simple process. It depends upon an economical utilization of the physical and chemical properties of certain stabilized chlorinated hydrocarbon solvents, notably trichlorethylene, perchlorethylene and tetrachlorethylene, which are used hot, either as a liquid or a vapor. These safety solvents have a high affinity for dissolving the oils, greases, waxes and fats found in compounds commonly employed in a wide range of factory operations in metal working.



Clearly visible in this photomicrograph of a lapped metal surface are some of the numerous small pores and crevices that are found even in such highly finished surfaces as this. Oil or grease that clings to all surface irregularities is quickly dissolved and removed by suitable chlorinated hydrocarbon solvent in a degreaser. Photo, courtesy of The Detrex Corp.

To quickly remove oil and grease, solvent degreasing capitalizes on the low-boiling point, low specific heat and high vapor density of the solvent in a carefully controlled manner. Solvent cleaning is performed in machines known as "degreasers". These units are specially designed to utilize the high dissolving powers, low specific heat, non-flammability and high vapor weight of the chlorinated solvents.

A degreaser is essentially a thermo-balanced open still with bottom heating arrangement and upper side wall means to control the height of the solvent vapors. By means of a trough located beneath the water-cooled condensers, the liquid solvent that has been condensed is collected and the steam is directed as desired.

Condensation of Solvent Vapors on Cool Metal

Degreasing is accomplished through condensation of solvent vapors on cool metal parts, followed by: 1) immersion in liquid solvent; 2) spraying work with warm solvent, or 3) any combination of these phases within a degreaser. The particular degreasing phase employed is generally governed by a number of factors, the most important of these being requirements of the work, gauge of metal, kind of grease or "dirt" to be removed, shape and size of parts, and space available for the work.

The simplicity, speed and efficiency of solvent degreasing can be easily visualized by studying the accompanying pictures of a pipe wrench, before and after cleaning. One picture shows the wrench thickly coated with heavy transmission oil. It is being sub-

merged into solvent vapors. Note particularly how the vapors, condensing on the cold metal, dissolve the heavy oil, which is dripping into the boiling chamber below. In the other picture you see the same wrench as it is removed. It is clean and dry after a one-minute dip into solvent vapor.

As long as the metal being cleaned is cold or cooler than the vapor, the solvent condenses on the metal and washes off the oil and grease. As the part emerges from the vapor zone within the degreaser, the solvent wash immediately leaves the work perfectly dry and clean.

What a Degreasing Machine Is and Does

A simple vapor degreaser consists essentially of a chamber in which the liquid solvent is heated, a space above this boiling chamber for hot solvent vapors (in which the work is cleaned) and a condenser to maintain the proper vapor level in the equipment; also there is a sideboard or freeboard above the water jacket or condensing area, properly proportioned to the machine's dimensions.

A condenser encircles the upper portion of the vapor chamber. In most instances it is a water jacket or a water jacket and condenser coils. The condenser condenses the solvent vapors and they return to the solvent chamber. The heat-absorbent capacity of the condenser is balanced against heat input, a balance readily kept, due to the fact that the solvent vapor is about 4½ times as heavy as air.

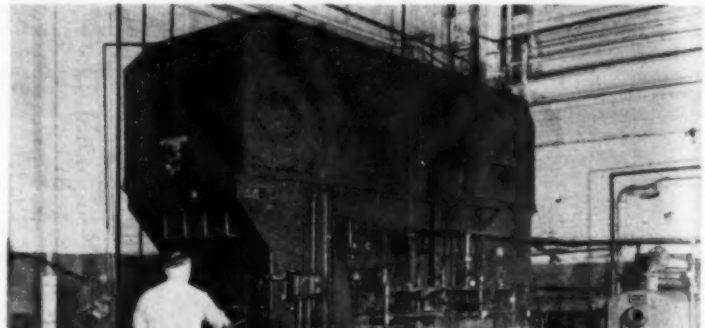
What Takes Place in the Vapor Degreasing Process

In vapor degreasing, the metal work to be cleaned is lowered into the vapor zone only. Here it is washed with chemically-pure chlorinated solvent vapors which, being warmer than the metal part, condense on the metal surfaces. The cleaning power of this vapor action depends entirely upon the difference in temperature between the metal and the solvent vapor. Condensate (liquid solvent) continuously washes the metal as long as the work remains in the vapor. The washing effect diminishes, however, as the temperature of the metal approaches that of the vapor.

Vapor-cleaning has three principal merits: 1) It is extremely simple; 2) the equipment costs less than apparatus used in other solvent degreasing cycles; 3) no matter how contaminated the boiling solvent becomes, only pure solvent vapors reach the work being cleaned. This latter fact is accounted for by the difference in the boiling point between the dissolved soil and the solvent. After parts are vapor-degreased, they are removed from the machine—oil-free, grease-free, warm and dry. The entire cleaning cycle generally takes less than a minute.

On the other hand, vapor degreasing has limitations. First, in cleaning large pieces of light gauge metal, the lower portion of work naturally gets heated first by the vapor. There is a tendency for this heat to be conducted up through the metal before the vapor can condense uniformly on the upper portion of the work.

Another point: Cupped or intricate-shaped work or beaded parts tend to trap the oil and solvent, and they may have air pockets which exclude the solvent vapors. Since there is no mechanical action (such as spraying, flowing, brushing, blasting, scraping) in vapor degreasing, this method is not effective when it comes to removing insoluble matter. Because this



Here is a typical 3-dip conveyorized immersion-type degreaser in which work is automatically transferred between the boil, rinse and vapor chambers within the machine. Return flight of conveyor is in hood overhead. In background, at right, appears a solvent still. Photograph, courtesy of The Detrex Corp.

method provides no mechanical cleansing action and because condensation depends on the lower temperature of metal being cleaned, one or more of the other degreasing means is often added to the vapor phase, in one machine.

Immersion Degreasing Gives Liquid Flowing Action

Parts of intricate design, or those that tend to nest into one another, can be cleaned by the *immersion degreasing process.* When it is lowered into the boiling solvent, the work receives a positive degreasing-cleaning action from the continuous sweep of boiling solvent over it. This continual motion of liquid provides a mechanical washing or scrubbing effect that helps to remove solid particles which are insoluble in the solvent.

Immersion-type degreasers may have one, two or three chambers. The customary sequence of cleaning operations in these machines comprises three steps: 1) Immersion of work in boiling solvent to remove heavy accumulations of grease and dirt; 2) transfer of work to a chamber containing clean solvent to rinse and cool the metal; 3) a pure vapor rinse for final cleaning and drying. Additional heat which quickly dries the work, is present in this final vapor rinse.

Two and Three-Chamber Degreasing Machines

In the 2-chamber machine, the second or cool-rinse chamber, which is separated from the first or boiling tank by a low dam, receives clean solvent condensate from the water-jacket condenser zone. This

reservoir or clean solvent overflows by gravity back to the boiling chamber to complete the solvent cycle. By submerging the work in the second, or cool rinse chamber, after it has been in the boil, the temperature of the work is lowered so that final cleaning takes place in the pure hot vapor.

It is desirable in some instances to provide straight-line operation for the boil-rinse-vapor cycle. Then a third chamber is added. This unit holds vapor only, as the condensate overflow from the rinse is continuously returned, by pumping or by gravity, to the boiling chamber. While solvent in the heating chamber admittedly becomes contaminated over a period of time, the rinse in two and 3-chamber degreasing units is constantly diluted by a continuous supply of clean condensate. Such a cycle insures high-quality cleaning. *It is fully effective on light gauge work or intricately-shaped parts, due to the fact that all work receives the benefit of a final pure vapor rinse.*

Spray Degreasing Gives Stronger Force Cleaning

Mechanical cleaning action caused by the roll of boiling solvent in the immersion degreasing technique may be insufficient, in some cases, to remove all insoluble matter from the work. If so, the spray method can be employed, utilizing either hand-operated "vapor-slush" degreasers or conveyorized machines known as "vapor-spray-vapor" units. A spray of warm solvent over the work removes all insoluble contamination.

Where the soiled surfaces to be cleaned are sheet metal or formed parts having pockets or trapped holes, the vapor-slush method is often used. The pieces are loaded into a wire mesh basket and lowered into the vapor-slush degreaser.

Following a preliminary vapor-cleaning, the work is sprayed with clean solvent distillate while it is still in the vapor zone, to remove insoluble matter such as buffing and polishing compounds. Sprayed solvent is distillate condensed from the solvent vapors within the machine and accumulated for the intermediate spraying operation. Additional pure vapor cleaning then leaves the work clean and dry.

This method is recommended for those cases where a small amount of spray per work load is required. Factors of safety and economy limit the quantity of distillate that can be made available for the slushing operation.

Merits of Vapor-Spray-Vapor Degreasing to Clean Metal

For removing caked-on soil or insoluble matter, the "vapor-spray-vapor" method is the most effective of the solvent degreasing series. In this particular process the work, after being wet first with solvent vapors, is pressure-sprayed with solvent to dislodge and remove the solid particles. This forced cleaning action reaches all depressions and cavities.

Spraying is followed by a final clean vapor rinse to assure complete removal of oil and grease. At the same time, this rinse imparts sufficient heat to the work to allow it to dry before it is withdrawn from the degreasing unit.

Some work, because of its size, shape and construction, can not be cleaned by immersion degreasing; also, it is difficult to adapt the immersion method to work that is moved along by an overhead chain conveyor. A spray process of cleaning is frequently employed for handling these large-size parts and assemblies. *(Continued page 28)*

Certain types of automatic and semi-automatic conveyors can be readily used in a vapor-spray-vapor degreaser setup. Choice of such equipment depends upon the size and shape of the work, and adaptation of the conveyor method to the particular production job.

Solvent Stills Included in Degreasing Machines

Degreasers can be designed and built so they are self-distilling for the reclamation of solvent after contamination. In these machines the degreaser itself distills and condenses the solvent into a satisfactory container. With some types of work, particularly in installations where it is not desirable to interrupt production, or where the grease and "dirt" removed are excessive, the use of a separate solvent still is suggested.

Solvent stills are so designed that they may be operated continuously or intermittently. A water separator removes any water that might be present. Each still is provided with a steam injector so that complete solvent stabilizer recovery is possible.

Solvent degreasing's important applications may be classified as:

1) Cleaning iron and steel parts before various product-coating and finishing operations, such as painting, lacquering, enameling, japanning, galvanizing, tinning, plating, bonderizing, granodizing, and cromodizing.

2) Removal of cutting, grinding and machining lubricants; stamping, forming and quenching oils; polishing and buffing compounds, lapping compounds, etc.

3) Preparing work for heat treating or pickling.

4) Cleaning machined parts where close tolerance requires careful cleaning before inspection, assembly or fabrication.

5) Cleaning all non-ferrous metals, including die castings of aluminum, magnesium, copper, brass, bronze, zinc and lead, or parts coated with these materials.

6) Cleaning before descaling and deoxidizing operations.

War production practice, supplemented by current reconversion experience, shows that solvent degreasing not only removes all grease and oil from parts quickly; but it provides certain additional features as well.

When used before scale and oxide removing processes, degreasing brings about a reduction in the consumption of chemicals, plus a saving in time which, on several occasions, has run as high as 40%. Since there is no solvent carry-over, subsequent pickling, plating or rust-proofing baths are not affected.

Precautions Essential to Insure Operating Safety

It should not be inferred that degreasing is a surface-conditioning "cure-all" for all metal work before finishing. This is not the case in actual practice, particularly where lard oil, white lead, rouge compounds or certain other tough-to-remove, solvent-resistant deposits are present. In such instances, or where surface contamination is particularly heavy, the degreaser method may only serve as a preliminary step to alkali cleaning. This dual treatment can produce the chemically-clean surfaces required for many industrial finishing operations. Following an alkali bath the work is rinsed in a protective solution, unless painting or plating is to be performed immediately.

No article on solvent degreasing would be complete without calling attention to the fact that safety

(Continued on page 112)

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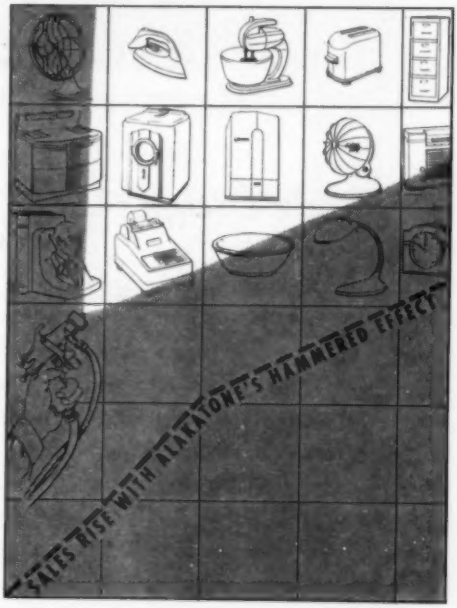

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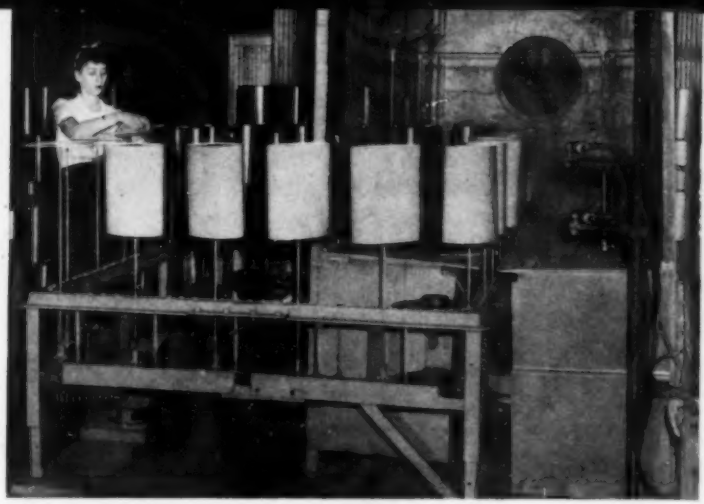

Fig. 1—Conveyorized automatic setup for spray painting metal wastebaskets within an electrostatic field which is arranged in an ordinary spray booth.

Electrostatic Spraying

What electrostatic spraying is, how it differs from a regular automatic spray-painting setup, what happens when paint is sprayed in an electrostatic field, what kinds of paints and products to be painted will work effectively in this kind of setup, and what the merits of electrostatic spraying are in production painting.

BY DR. EMERY P. MILLER

Harper J. Ransburg Co.

BEFORE and during the late war, a number of electrostatic spraying installations were placed in factories that paint their products. To understand electrostatic spraying quickly and easily, let's first consider ordinary high-pressure spraying on a production basis. Take, for instance, a regular conveyorized automatic spraying setup for painting the outsides of metal wastebaskets. Each basket is inverted over a perpendicular holder which rotates the basket as the conveyor moves it along through a spray booth in which three stationary spray guns are mounted so as to spray material directly onto the containers.

To convert or change this setup to electrostatic spraying, we keep

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the same equipment and use the same materials—but we make certain important paint-saving adjustments which will be explained later. Within the spray booth we arrange suitable metal electrodes which, when charged from a special electric source, produce an electrostatic field within and around the spray painting zone. The guns are directed approximately parallel to the conveyor so as to atomize their material into this field, and in this case the number of guns is reduced to two. A typical electrostatic setup for spraying metal wastebaskets is illustrated in Fig. 1.

Adjustments in Material, etc., for Electrostatic Spraying

Now to the paint-saving adjustments previously mentioned: First, we see to it that the paint is correctly adjusted to atomize properly at a relatively low air pressure, perhaps as low as 15 or 20-lbs. per square inch. The solvent balance of the paint may need to be readjusted too, so that the paint particles will stay wet a little longer for successful electrostatic spraying. Spray guns are adjusted to properly atomize the paint at lower air pressure. Fluid pressure is reduced to less than what is customarily used for high-pressure spraying.

What happens when spraying begins? *The finely atomized particles of paint, coming from the spray guns in a gentle air stream of suspended paint fog, become ionized or charged with static electricity of the same polarity as the electrodes. This is of opposite polarity to the metal wastebaskets moving along on the conveyor. Instantly those electrically charged paint particles from the spray guns are attracted to the metal wastebaskets within the electrostatic spraying zone. Paint is deposited smoothly and uniformly over the rotating surface of the product being painted.* The action is similar to electroplating, with certain exceptions, of course.

When such a setup is properly adjusted and balanced in every respect, most of the paint that leaves the spray guns becomes useful paint film on the products being painted. There is very little overspray. Paint particles which otherwise would miss the product being painted, become electrically charged and instantly change their course to fly to the metal surface that attracts them. As one item being painted moves beyond the zone of attraction, a following item moves forward to enter the zone—and electrically charged paint particles begin coating it.

Performance of Sprayed Paint in Electrostatic Field

By having a relatively low-pressure air stream carrying the wet paint particles, it is possible for the power of electrical attraction to be effective in drawing to the product being painted, most of the

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paint which otherwise would be spent as wasteful overspray. The small amount of paint that does escape this electrostatic attraction, and the evaporating solvent fumes, are exhausted through the regular spray booth exhaust system.

Variety of Products Can Be Electrostatically Sprayed

Naturally, the possibilities of this process are far-reaching. A great variety of parts and products can be economically spray painted in electrostatic zones. They can be suspended from overhead chain conveyors or moved through spray booths by other types of conveyors. Rotation or non-rotation of the object is determined by its size and general character. Such items as metal wastebaskets, radio tubes, automobile air filters, water heater jackets, lamp shades and bases, and cylindrical containers of all types are rotated because their external symmetry readily permits such rotation, and increased efficiency of paint application is obtained by combining the merits of mechanical rotation with those of electrostatic attraction.

Such items as flat sheet stock, corrugated panels, cabinet panels (assembled or non-assembled), pipe of small diameter, Venetian blind slats and structural steel members can be coated either overall or on one side only, without rotation. They present to the electrostatic field and spray guns a flat extended surface which appears continuous as the separate parts move along by conveyor.

Still other irregularly shaped articles which are normally not visualized as possibilities for automatic spraying, can be coated by this method, because of the extended region over which coating material is attracted to the items. Automobile lift jacks, air cleaners, steering wheels, mouldings, and mufflers, as well as electric motor castings, washing machine parts and metal furniture are illustrative of such parts. They can be rotated or not as the individual case demands.

Electrode Structure for Electrostatic Spraying

The electrode structure used in conjunction with electrostatic spraying consists of a rigid frame mounted adjacent to the path of travel of the conveyor and spaced at about 11-in. from the surfaces being coated. Small wires are supported across the face of the electrode frame on those sides which are opposite the surfaces being coated. In Fig. 1, for example, these wires are on the sides and top of the electrode frame.

The complete electrode assembly is mounted on insulators so that it has at least 18-in. clearance to the nearest grounded part, and it is connected to the voltage source which charges it to a high static voltage. When held at this voltage the small wire elements become ionizing agents which impart an electrical charge to each of the isolated paint particles. The wires simultaneously establish the field of force under the action of which these charged particles of paint are attracted to the work.

In Fig. 2, the voltage source which maintains the necessary field is shown in the right background. This unit is a completely oil-immersed rectifying unit capable of converting the normal 220-volt, sixty-cycle, alternating current into the desired rectified voltage of approximately 100,000 volts. Designed into this unit are features which insure that the

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SODOL SOLDERING FLUX, in addition to fluxing, sticks to oily metal and dissolves rust. The use of Sodol Soldering Flux therefore eliminates the operation of cleaning the metal with solvent and acid prior to the application of soldering flux.

Sodol Soldering Flux is a non-inflammable liquid. It may be applied by brushing or dipping, and is suitable for soldering with either an iron or torch. No unpleasant odors are evolved.

Three varieties are manufactured for soldering steel, stainless steel, and non-ferrous metals.

Preparing Aluminum for Spot Welding

THE USE OF ETCHENE A-L for preparing aluminum for spot welding enables one to produce strong welds consistently, and will increase the number of welds obtained before it becomes necessary to clean the welding electrodes.

Etchene A-L makes these desirable results possible by dissolving from the surface of the aluminum the invisible oxide coating which acts as an electrical insulator.

Where parts are to be painted after spot welding, the use of Etchene A-L is especially advantageous because it etches the aluminum, thus producing a tooth for the paint.

Metal treating and cleaning chemicals for 25 years

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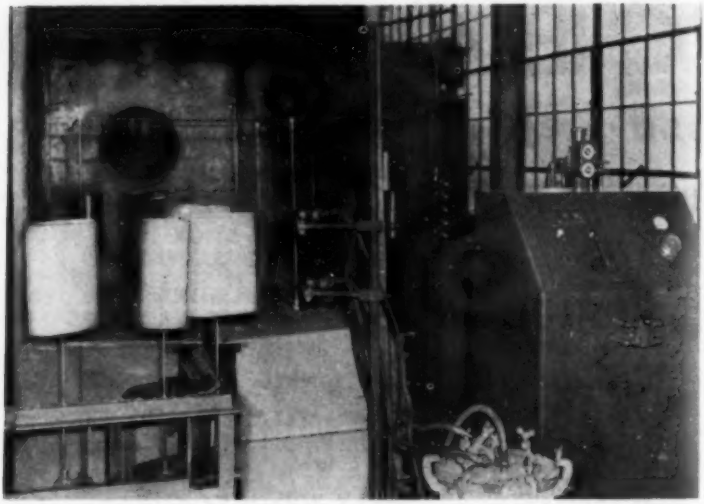

Fig. 2—Electrical and mechanical controls are housed in cabinets at right.

current delivered at this voltage cannot exceed a safe value. When the output of this unit is shorted through low resistance, the current will not exceed .010 amperes. Under normal operation the power consumption of this unit is comparable to a 1000-watt lamp. Being constructed without moving parts the unit requires little maintenance. Occasional replacement of tubes is the only attention that is normally required.

Spray Guns Are Adjusted for Low-Pressure Spraying

The spray guns are basically the standard type of automatic gun. Special fluid tips and air caps must be selected from those produced by manufacturers, because the material must be broken up at lower air pressures than those used in high-pressure spraying. It is the purpose of these agents to atomize the material and distribute it into the field with a minimum mechanical velocity, so that the electrostatic field can accomplish the precipitation.

Where it is an advantage to do so, the spray guns are oscillated back and forth over a distance of several inches during the spraying operation. This oscillation aids in the distribution of the coating material in the field and destroys the mechanical pattern sometimes produced by individual stationary guns on the work. In this manner more uniform coats of material are assured. Atomizing pressures are usually about 15 to 20-lbs. per square inch. Fluid pressure is likewise reduced below what is normally used in standard spraying. Three to 4-lbs. per square inch of fluid pressure is normal for electrostatic spraying with regular spray guns. *(To page 41)*

Because the values of these pressures are important to the successful operation of the equipment the pressures are carefully controlled by suitable means housed within the control cabinet shown at the right in Fig. 2. Electrical controls are also housed within this same unit. Complete operation of the equipment (including starting and stopping the guns, regulating all pressures and turning the field off and on) can be carried on from this position.

Everything Set Up to Work Just Right

As is the case with any automatic equipment, complete correlation must be established between all related factors before electrostatic spraying proceeds successfully to produce a well coated article. Fluid and atomizing pressure must be carefully correlated with conveyor speed and film thickness requirements. The spray guns must distribute the coating material into the field as uniformly as possible. The particle size of the atomized material must be reasonably fine to assure that the electrostatic field will effectively act upon it. This latter feature is controlled in real production by controlling the fluid pressures, solvent balance and viscosity.

Since in this method of spray application, a somewhat longer time elapses between atomization and precipitation of the material on the surface of the part than elapses under high pressure methods, it is necessary to readjust the solvent balance in the coating material to make it satisfactory for this type of application. This adjustment is usually directed toward making the material "slower". Since this adjustment is only necessary because the material is in the air longer and the solvents consequently have a longer time in which to evaporate, the material precipitated onto the part is in the same condition as it is when applied by high-pressure methods. Because of this, normal baking and air-drying cycles are applicable.

What Materials Can Be Electrostatically Sprayed

All types of materials are applicable by this method, so long as they can be atomized at the lower atomizing pressures used and can be adjusted in solvent balance so that a satisfactory wet film can be precipitated. Synthetic enamels, cellulose lacquers, aqueous suspensions, wrinkle and splatter finishes, oils, and some chlorinated-rubber type adhesives have been successfully applied.

The material of which the part is made is of importance in determining the applicability of electrostatic spraying. The process is applicable to all parts made of electrically conducting material, and is not limited to materials that are magnetic. The process is applicable to aluminum, brass and copper as well as to iron and steel parts. Items made of nonconducting material, such as Bakelite, porcelain, hard rubber, and wood, require special consideration.

Ceramic flower pots and wood drapery fixtures are listed among the possible applications, but such items must be handled in a special manner and should best be considered as individual cases. On items made of such materials some arrangement must be made so that the part becomes a collecting electrode for the sprayed material. Flower pots, for example, can be inverted over a conical metallic fixture; and flat sheets of acoustical tile or other insulating material can be laid upon a conducting

metal mesh belt in order to create the necessary precipitating field over the surface to be coated.

Flat Surfaces, and Items That Can Be Rotated

Uniform flat surfaces, and those uniform surfaces which can be rotated, offer no difficulty for the electrostatic spray method. The film made on this type of work is practically uniform in thickness. On other items, the uniformity of coating that can be obtained depends largely upon the contour of the part. Since the electrostatic field is responsible for the precipitation, the coating is light where the electric field is weak, and normal where the electrostatic field is strong. For this reason, protruding sections are favored over recessed surfaces, whereas the internal coating of comparatively closed openings is practically impossible. On some objects possessing this character the shielded or recessed sections can be satisfactorily coated by aptly directing the spray guns so that such sections will be mechanically covered by direct spray, while the overspray from such guns is applied to other parts of the object by the precipitating action of the electrostatic field. Such objects must be tried before actual results can be predicted or applicability of the method determined.

The electrostatic spraying method has as its major merit the highly efficient application of coating material in a fully automatic manner. As a result the application of the method affords real sizable savings in material and labor.

Saving Depends Upon Several Different Factors

The exact savings which will result from the adoption of this method will vary from application to application, since the replaced method may or may not be efficient, and the item involved may or may not be one which presents a large range of saving possibilities. On small incidental parts, where ordinarily there is considerable overspray, large savings can usually be expected. On large flat sheets or similar areas where the usual hand or automatic spraying is somewhat more efficient, the savings are correspondingly less. In general, and considering all these variations, the adoption of electrostatic spraying may result in a material saving of 40% to 60% of the material used.

Tanner Chemical Co. Makes Rust-Proofing Chemicals

Incorporation of the Tanner Chemical Co., Ferndale, Mich., manufacturer of rust-proofing chemicals and processes is announced by Robert R. Tanner, President. Other officers are Wm. R. McKenzie and George M. Burgess, Vice-Presidents; Sherwood Field, Secretary and R. H. Buckley, Treasurer.

Tanner Chemical is marketing Tannerite No. 11, a heavy phosphate coating chemical and process developed by Robert R. Tanner, a leading research chemist in the field of rust-proofing. Mr. Tanner, for years Director of Research at Parker Rust Proof Co., is internationally known as the inventor of the Bonderite chemicals and processes.

The Tannerite No. 11 process eliminates the use of heating coils in processing tanks and the objectionable maintenance of frequent scale removal. Sludge in the bath, which causes a build-up on threaded parts and scale on flat work, is practically non-existant.

A recent production test run at one of the major automotive plants showed rapid processing time with clean, uniform top-quality results.

The corporation's new plant at 1250 Wordsworth, Ferndale - Detroit 20, Mich., is now under construction.

United's Quik-Bake One Minute Baking Enamel

A one-coat operation—no primer necessary. Speeds production tremendously—reduces man hours of labor and cuts finishing production costs.

Bakes in 1 minute at 500 degrees in a conveyor oven or in 8 to 10 minutes at 300 degrees F. in standard type ovens.

Made of pure synthetic resins. Bakes to a hard, tough, flexible mar-proof finish. Resistant to grease, dust, acids, alkalis, water and salt spray.

Can be roller coated, sprayed or dipped—available in white and pastel shades.

Quik-Bake is recommended for Refrigerators—Metal Cabinets—Metal Furniture—Metal Venetian Blind Slats—Fluorescent and other Lighting Fixtures—Kitchen Cabinets, etc.

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NEW ENGLAND MFG. DIVISION, EVERETT, MASS.

Copper-plated steel lamp base given a glossy black finish by the Ebonol "C" Process. Photograph, Enthone Co.

BY ARTHUR P. SCHULZE

CHEMICAL *Black and Color Finishes for Metal*

ONE OF THE trends in the field of metal finishing during war years, was the increased use of black oxide coatings on products and parts fabricated from ferrous and non-ferrous metals. Having demonstrated their usefulness in a wide range of war work—speedy application, simplicity of operation, durability, protective value and corrosion resistance—they now appear headed for greater utilization as a protective metal finish, or as an undercoating for organic finishes. A review of black oxide finishing, therefore, appears to be of timely interest and value.

Factory experience has shown that, in most instances, black oxide coatings, compare favorably with many of the more conventional type finishes. They impart, by penetrative chemical action, an attractive, durable, wear resistant finish on a great variety of iron and steel parts and products at comparatively low cost. The dense rich blue-black or jet black coatings are firmly adherent, uniform ferro-ferric oxide films of from .00004 to .0001-in. in thickness, impregnated in the base metal. They make little or no dimensional changes in parts processed; they withstand severe deformation, and temperatures up to 600° F.

In the category of oxidizing techniques are, among others, *Black-Magic*, one of the first single-

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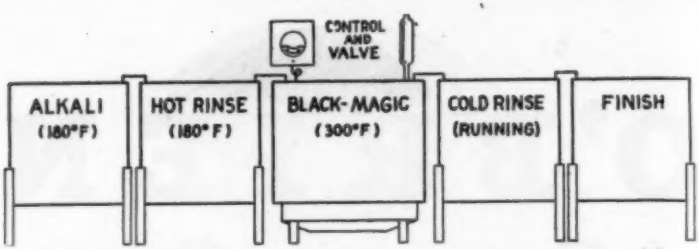


Black Magic setup for steel and iron. Mitchell-Bradford Chemical Co., diagram.

bath treatments developed; *Ebonol "S" Process*, also a one-bath procedure; and the *Du-Lite Chemifinishing Method*, utilizing either a single or double immersion, depending on conditions. All are similar in general principle, but they vary in operational details. For the purpose of illustration, let us consider the blackening cycle of Black-Magic for a moment. It is fairly typical of most oxidation routines for black oxide finishing.

The parts to be finished are strung on iron wires, placed in baskets, or hung on hooks or racks, depending upon their shape and size. Then follows:

1) Immersion in hot alkaline cleaner for five minutes, or a little longer if necessary. Temperature, 180° F. plus.

2) Rinsing thoroughly in clean hot water.

3) Immersion in recommended blacking solution, boiling at 300° F., for from 5 to 15 minutes, depending upon depth of color of penetration desired.

4) Rinsing thoroughly in cold water.

5) Immersion in boiling bath of soluble oil, made up as directed.

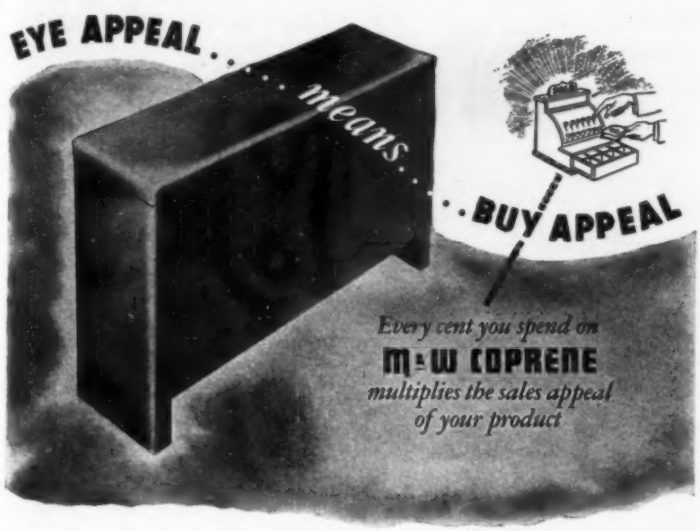
In cases where maximum corrosion resistance is required, the soluble oil finish is replaced with either a wax-base compound or a water-displacing oil. If parts have been cyanide-hardened, carburized and hardened, scaled or oxidized in any way, removal of this scale or oxide is necessary before immersion of work in the blackening tank. Pickling may be performed with the familiar inhibited muriatic or sulphuric acid dips, or with any of the well-known commercial pickling solutions.

When the coating produced by this process is to serve as a base or bond for paint, lacquer or varnish, the work is neutralized, after coloring, in a chromic acid bath for 5 to 10 seconds (or slightly longer where required in unusual instances) and then subjected to a cold water rinse.

Processing Precision Gages for Visual Control

Originally designed for bluing gun parts, Black-Magic has become a standard finish on many other items. Also, in this connection, is its patented application to processing precision gages for visual control. The black coating provides: 1) protection against corrosion and stain from sweaty hands, 2) visual inspection of flaws and cracks, and 3) protection against tampering.

The blackening solution penetrates the surface not more than .0001-in. and makes no changes whatever in the precision dimen-



M & W Coprene air-drying enamels increase the sales appeal of such products as metal or wood cabinets, furniture, air-conditioning equipment, and many other special products where a handsome, high-gloss, chemical-resistant finish is desired. They protect and prolong the life of such products because of their excellent adhesion to steel and great resistance to weather and most chemicals.

Coprene can be supplied in plain air-drying enamels, synthetic metallic enamels that air-dry to a lustrous metallic finish, or in air-drying Hammertone finishes. Coprene air-dries dust-free in a few minutes and hard overnight, but can be force-dried. Available in standard colors in: plain enamels, synthetic metallic enamels or Hammertone finishes.

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Close tolerance, machined steel gages, blackened by the Black Magic process. Photo, Mitchell-Bradford Chemical Co.

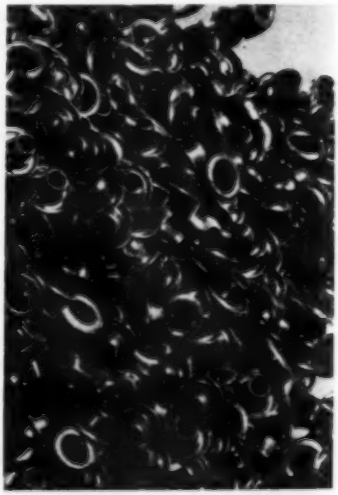
sions, surface hardness or wearing qualities of gages. The gage is placed in service and used until bright steel shows through the blackened surface. It is then laid aside for checking. If it is not too badly worn it may be re-blacked and again placed in service. This process is continued until the allowed tolerance is used up. Most gages have a tolerance beyond .0001-in., and this procedure results in the saving of considerable time and money on gage checking, as well as eliminating guesswork in handling this job.

Chemical Processes for Blackening Zinc

Representative of the simple-immersion, fast-working, inexpensive procedures available today for directly blackening sheet zinc, electroplated zinc and zinc die castings, are the Ebonol "Z" Process and the Black-Magic Methods. Both produce coatings that may be used as final finishes, or they will serve as excellent bases for organic finishes, particularly baking enamels and lacquers. Take the first-named technique as an example.

Here, the normal blackening procedure consists of three principal steps: 1) degreasing the work with a special alkaline-type cleaning agent which activates the surface; 2) rinsing thoroughly; 3) immersing work in blackening solution, temperature 125° to 180° F. Blackening time is determined by activity of the zinc to be processed. For electroplated zinc, the time is five minutes; for zinc alloys, about ten minutes are required for blackening.

The coatings obtained are black inert metallic oxides which cannot be scratched with a finger nail. Thickness ranges from .00004 to .0001-in.; dimensional changes involved in blackening are about .00003-in. The coatings withstand mild deformation. Beautiful, shiny-black finishes are produced on smooth bright zinc surfaces, and uniform matte coatings show



Zinc grommets with oxide type black finish. Photo, courtesy of Enthone Co.

Here is Egyptian's new Baking White Enamel

Resistant to:

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ALKALIS · SALT SPRAY · HUMIDITY
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Spray it on clean bare metal. Needs no primer. Bakes fast to a hard, glossy finish.

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up on etched or brushed surfaces. If castings to be treated have a poor surface finish, it is suggested that the surface be given a brushed finish before the blackening treatment.

Use of Ebonol "Z" coatings as a base for organic finishing has shown a remarkable increase. The use of lacquer, enamel or paint on an untreated zinc surface is generally unwise because the reaction between active zinc and an organic finish frequently results in poor adhesion and blistering of the organic coatings, particularly if it is a high-baking enamel.

The chemical blackening process provides an easy dependable way to treat zinc surfaces for making them receptive to paint, varnish, enamel or lacquer finishes. It insures firm adhesion of the final finish over long periods of time. Because of the small amount of zinc removed by the blackening procedure, the method is proving particularly suitable for electroplated zinc.

Blackening Cadmium and Cadmium-Plated Steel

Cadmium and cadmium-plated steel can be blackened in various ways. One method is by zinc flashing and then blackening the zinc with Ebonol "Z" salts. Another technique is based on the use of Black-Magic salts. Where this method is followed, parts are first degreased with a suitable alkaline cleaner, then immersed in the blackening bath for 5 to 15 minutes. Rinsing and treating the surface with water-displacing oil, or tumbling in sawdust to which a little oil has been added, complete the operation.

Iridite Treatment for Plated Parts

Another cadmium-blackening process has been made possible by *Iridite Treatment*. It is applied not only to cadmium-plated assemblies, as a means of increasing their corrosion resistance, but also to zinc-plated surfaces, zinc die castings, and hot dip galvanized parts for the same purpose.

The Iridite Treatment gives a protective coating of sufficient thickness to withstand a reasonable amount of wear and resistance to spray, liquids, condensed moisture, etc. It is produced by treating the surface so that it combines chemically with a chrome salt, with the resultant newly formed compound being "welded" into and on the surface. It does not alter the dimensions of an article. The treatment removes about .00003-in. of the plate. Average thickness of the

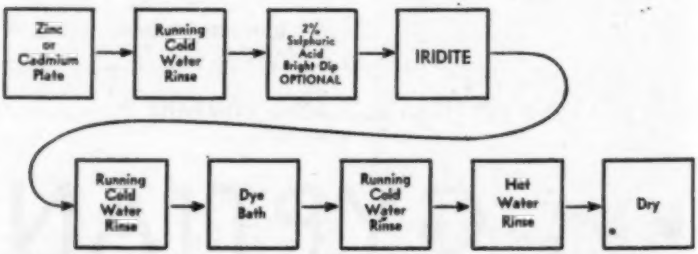

Chart of Iridite Treatment for blackening zinc of cadmium plated work.

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TO PROVIDE many products with more sales appeal, Pittsburgh offers Lavax Wrinkle Finishes.

Here's an enamel with a thousand-and-one uses. It combines beauty with durability and economy and can be applied effectively on many kinds of surfaces—on steel, aluminum, cast iron, plastics, etc.

Its non-reflecting quality hides dust and dirt. It cannot be scratched or scuffed by repeated handling.

Many manufacturers use Lavax Wrinkle Finishes as their standard one-coat finish, thereby saving time and eliminating costly pre-finishing operations as the heavy texture of Lavax Wrinkle Finishes covers most surface flaws and imperfections with a single application. They give the appearance of expensive embossing at a fraction of the cost of embossing.

Write for a Lavax Wrinkle Finish Color Card which illustrates the fourteen different colors in which this product is available.

PITTSBURGH PLATE GLASS COMPANY, Industrial Paint Division, Pittsburgh, Pa. Factories: Milwaukee, Wis.; Newark, N. J.; Houston, Texas; Los Angeles, Calif.; Portland, Ore. Ditzler Color Division, Detroit, Mich. The Thresher Varnish Co., Dayton, Ohio.

PITTSBURGH *Industrial* FINISHES

PITTSBURGH STANDS FOR QUALITY PAINT AND GLASS

film is .00001-in. The coating is extremely ductile and normally it withstands any bending operation that the plated surface will stand. No cleavage plane is considered to exist between the base metal and the film.

In addition to black the two most widely known Iridite-colored coatings are olive drab and bronze. They are generated as a result of the reaction of the Iridite solution with the metallic surface. Black, green, blue and red can be obtained by dyeing operation following the Iridite bath.

Colors Other Than Black by Iridite Process

Extremely flexible and readily adaptable to all types of processing lines, this particular treatment is discussed here primarily from the standpoint of its application for blackening cadmium or zinc-plated articles. Iridite works best when it is part of a plating installation. Under such a set-up, parts are "Iridite-blacked" immediately after plating. The work is thoroughly rinsed following removal from the plating solutions, Iridited by dipping in O.D. solution from 10 to 60 seconds at normal room temperatures (between 75° and 90° F.), blackened by immersing in a dye bath, then rinsed in one or two tanks of running cold water or spray. The work is agitated mildly while in the Iridite solution to insure uniform coverage and a finer surface.

Cold rinsing is followed with a short dip in hot water (up to 160° F.) which is adequate for rapid drying. This hot rinse is recommended because it greatly reduces drying time and eliminates the need of elaborate drying equipment. Final drying procedure is a matter of personal choice, governed by the production requirements and type of equipment available. The work may be air-dried, blown dry, centrifuged or put through a drying oven.

If zinc or cadmium-plated surfaces are allowed to stand a long time after plating, so they become soiled or oxidized, then they must be degreased and deoxidized before entering the Iriditing and blackening operations. Iridite will not form its protective coating unless the metal surface is entirely free from all foreign matter. Grease-covered or oil-spotted surfaces can be cleaned by immersion in a standard hot alkaline cleaner, until all of the surface oils and greases are completely removed. Subsequent bright-dipping in a ½ of 1% nitric acid bath then removes any oxide formations that may be present.

In blackening zinc die castings by this technique, it is not necessary to condition their surfaces by zinc-plate flashing. All that is needed is to clean the work in a hot anodic-type cleaner without current, at 200° F. for several minutes. After a cold running rinse, the zinc die castings are then neutralized in either a muriatic or sul-

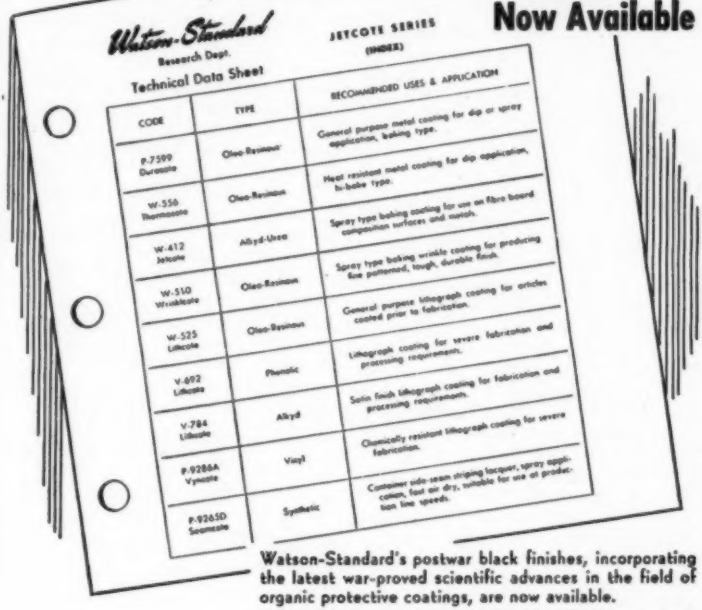
Durable corrosion-resistant black finishes for bright clean iron, steel, zinc and cadmium surfaces; black and color finishes for copper and brass alloys, all produced by immersion in hot solutions of chemicals. Will serve as final finishes in glossy or matte luster, or as good undercoats for paints, varnishes, lacquers or synthetics.

The Lid's Off!

JETCOTE

Series of BLACK Protective Coatings

Now Available



Watson-Standard
Research Dept.
Technical Data Sheet

JETCOTE SERIES
(INDEX)

CODE	TYPE	RECOMMENDED USES & APPLICATION
P-7599 Durocote	Oleo-Resinous	General purpose metal coating for dip or spray application, baking type.
W-556 Thermocote	Oleo-Resinous	Heat resistant metal coating for dip application, bi-bake type.
W-612 Jetcote	Alkyd-Urea	Spray type baking coating for use on fibre board composition surfaces and metals.
W-510 Wrinklecote	Oleo-Resinous	Spray type baking wrinkle coating for producing fine patterned, tough, durable finish.
W-525 Lithcote	Oleo-Resinous	General purpose lithograph coating for articles coated prior to fabrication.
V-692 Lithcote	Phenolic	Lithograph coating for severe fabrication and processing requirements.
V-784 Lithcote	Alkyd	Satin finish lithograph coating for fabrication and processing requirements.
P-9286A Vynocote	Vinyl	Chemically resistant lithograph coating for severe fabrication.
P-9265D Seamcote	Synthetic	Container side-seam striping lacquer, spray application, fast air dry, suitable for use at production line speeds.

Watson-Standard's postwar black finishes, incorporating the latest war-proved scientific advances in the field of organic protective coatings, are now available.

More attractive and more durable black finishes on steel, tinplates and many other surfaces are now made possible with this versatile series. Write today for a copy of the Jetcote Technical Data Folder.

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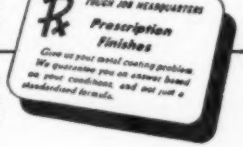
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Prescription Finishes
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phuric acid solution of from 1% to 10% at room temperature for a few seconds. Iriditing and blackening with dye follow.

Lusterless or Glossy Surfaces in Color

Iridite O.D. and the other Iridite colors can be made lusterless or glossy by simply varying the plating operating routine—depending on the finish of the base metal and the type of plating and Iridite procedure followed. The exact nature of the final finish is governed mainly by the original surface of the work. If the piece was smooth and polished, the coating will be of the same nature. If the surface was rough and porous, the final coating will be similar. Since Iridite takes the characteristic of the underlying plate, a bright plate will tend to produce a bright Iridite. When a dull surface is required, the temperature of the hot rinse is raised, or the immersion time in that bath is increased.

In addition to increasing the utility of cadmium and zinc, Iridite protective coatings are finding wide use as undercoatings for paint. Extensive tests conducted by paint manufacturers and independent laboratories prove that these coatings provide an excellent bond for paint or lacquer, without sacrificing any of the anti-corrosion values of the Iridite coating.

Black-Finishing Copper and Brass

Blackening of copper and brass as well as of copper-plated articles has come into general use too. These coatings are generally produced by chemical treatment in an alkaline mixture, called Ebonol "C", under U. S. Patent No. 2,364,-993. The finish can be dull or bright; it does not chip or flake and it has a high chemical stability. The coating is an excellent finish in itself, or it will serve as as a base for subsequent coatings of paint, lacquer or enamel.

The procedure for blackening copper and copper alloys containing 80% or more of copper is as follows:

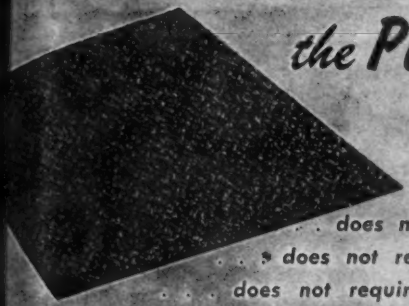
1) Clean with alkaline cleaner.
2) Rinse in running cold water.
3) Bright-dip in nitric-sulphuric acid bright dip, or by means of a chromic acid dip. Buffed work is given a short dip in a solution (4-oz. to the gallon) of sodium cyanide.
4) Rinse in running cold water.
5) Blacken in proprietary blackening solution at 210° F. for from 5 to 15 minutes.
6) Rinse thoroughly in running cold water.

The final treatment depends upon whether a dull or glossy finish is wanted. For a dull finish, the surfaces are brushed with a horsehair-bristle wheel or tumbled in wax. For a bright finish, they are given a short dry tumble or wiped with a dry cloth and then lacquered. On buffed surfaces, the black coating is given a light buffing.

Variety of Bright Colors Produced on Copper Alloys

Forming unique colors on copper and brass—colors that are beautiful, chemically stable and durable—has now been made entirely practical by the recent development of the Ebonol "C" Process. It is possible to color brass—particularly electroplated brass of from 60% to 70% copper content—to many shades. Tones or colors produced are determined by treating time, temperature and concentration of the coloring bath.

The colors obtained will vary according to the copper alloys treated by this process. Gold, blue, blue-



the PERFECT wrinkle

. . . does not lose its pattern
. . . does not gas check
. . . does not fail to wrinkle
. . . does not object to irregular surfaces
. . . does not require special baking facilities
. . . does not require precise temperature control

— Does not exist!

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GAS-PROOF WRINKLE FINISH COMES CLOSER TO MEETING THE ABOVE REQUIREMENTS THAN ANY ONE TO DATE!

Available in fine, medium and coarse patterns, Zapon Gas-Proof Wrinkle has been found to *retain* its pattern under all different types of application—while maintaining the high standards of toughness, long wear and resistance to corrosion characteristic of *all* Zapon finishes.

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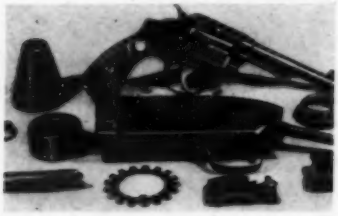


A great variety of parts are treated chemically to produce the adherent black finish. Mitchell-Bradford photo.

green, peacock, green-brown (Old English) and brown (statuary brown) can be produced on brass. Where only browns on copper and brass are desired, a special solution is employed.

Colors formed by direct oxidation of the base alloy are extremely adherent; they do not flake. While stable chemically to indoor atmosphere, they are usually coated with clear lacquer to prolong their life and to protect them against mechanical wear. Unlike sulphide finishes, they do not crystal spot or fade.

Finishes of top quality are obtained on buffed surfaces. The processing cycle is simple. After oil, grease and shop dirt are removed in a non-tarnishing alkali cleaning bath, the work is rinsed thoroughly and then immersed in the coloring tank, with temperature ranging from 150° to 200° F. The color obtained will depend upon immersion time. This varies; 15 seconds for gold color, 30 seconds for blue, two minutes for statuary brown. After the desired color is obtained, work is then rinsed, dried and lacquered.

This treatment gives excellent color depth. These colors are used on many different products—lamps, lighting fixtures, hardware, buttons, buckles, eyelets, snaps, grommets, tacks, screws, nails, vases, urns, grave markers, nameplates, vanities, lipstick cases, wire screen and ash trays. In fact, any article that can be brass-plated can be colored by this technique.

On the basis of successful performance turned in by these and other chemical finishing techniques during the war years, it appears reasonable to predict that more manufacturers will find in these protective finishes and decorative coatings, answers to some of their postwar finishing problems.

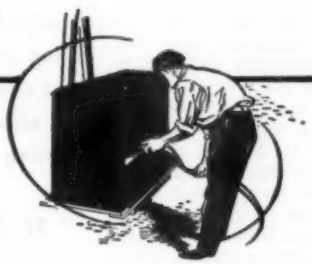
Yarnall Adds Geo. D. Freed to Its Sales Staff

The Yarnall Paint Co., Philadelphia, Penna., announces the appointment of Mr. George D. Freed to the Sales Staff. Mr. Freed has had many years experience in the paint industry and will make his headquarters in Orwigsburg, Penna.

Perrone, Director of Research for Watson-Standard

Joseph M. Perrone has been appointed Director of Research by Watson-Standard Co., Pittsburgh, Penna. For the past three years he had been doing research work and development work on protective coatings at Mellon Institute of Industrial Research. During the war he was also an instructor in plastics, protective coatings and organic chemistry for Pennsylvania State College. He is a member of Amerian Chemical Society, Pittsburgh Chemical Society, Pittsburgh Chemist Club, Society of Plastic Engineers, and Paint & Varnish Production Club.

Jos. M. Perrone is now Director of Research for Watson-Standard



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FILCOTONE eliminates expensive stage-coach methods of staining, wash coating, sanding and filling—operations which frequently require 48 hours.

FILCOTONE substitutes one application for three; one handling for three; 1½ hours air drying time for 48. That *is* streamlining.

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Continuous Production

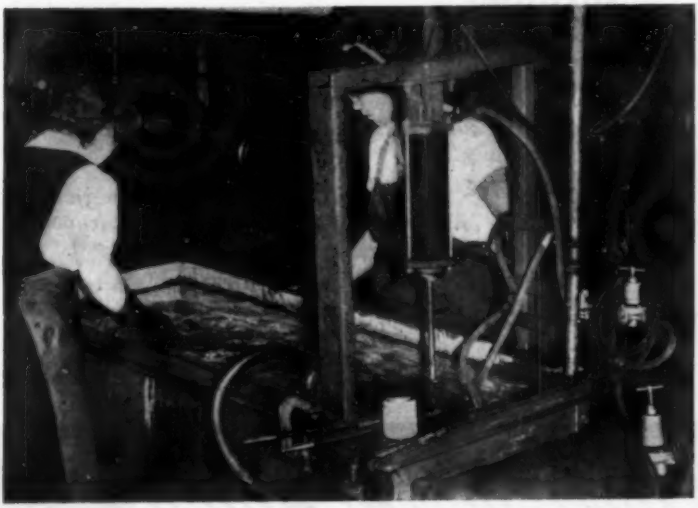
METAL CLEANING; DIP COATING; BAKING

Analysis of a war production setup reveals many features that can be adapted profitably for cleaning and protectively coating peace-time products.

BY GILBERT C. CLOSE

WITH THE white heat of war production now but an unpleasant memory, it is time to pause and examine some of the interesting methods that were developed to give greater production in less time than ever before accomplished. Some of these methods were crude and wasteful, in the light of civilian production and economies, but others suggest better, more efficient and speedier peacetime manufacturing procedures.

The finishing department at Western Stove Co., in Los Angeles, wherein M-16 powder cannisters for the 155-mm. field rifle were painted, is one setup that bears careful post-mortem analysis. This department reached a state of efficiency seldom equalled in any establishment. Three consecutive



Pressure testing the M-16 cannisters prior to cleaning and painting.

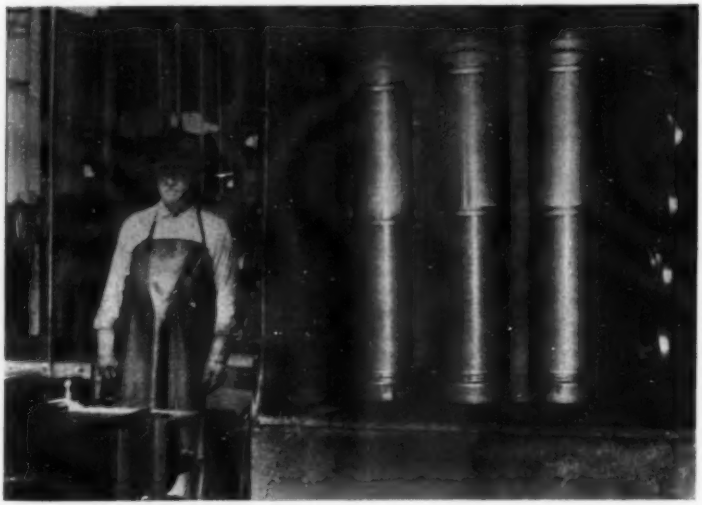
8-hour shifts of 15 persons cleaned, painted, dried and loaded more than 5000 cannisters every 24-hour period.

When the cannisters entered the finishing department, they did not cease motion until they were safely loaded into a freight car that would carry them to the various embarkation centers. This is the sort of streamlined production that will help to bring postwar costs down, even in the face of high labor costs

The M-16 powder cannisters were made of 1020 low-carbon steel, with seam-welded body and one end-plug spot welded in place. The open end of each cannister was provided with a pressure-sealing cover. Specifications required that each cannister be tested under water, using 3-lbs. per square inch of air pressure. To make doubly sure that every cannister was really water-tight, they were tested instead at 15-lbs. per square inch pressure as a final inspection measure, prior to entering the finishing department.

Preparation for Painting; Cleaning, Rinsing, Drying

After being pressure tested, the cannisters were placed on a roll conveyor and sent to the cleaning department. At this point two workmen removed the "cans" from the production line, and hung can body and lid separately on a continuous conveyor chain which carried them through a pressure-jet cleaning chamber where they were subjected to the cleaning action of a hot alkaline cleaner. After traveling through the cleaner,



Cannisters leaving the production line, are transferred immediately to an overhead conveyor that carries them through a cleaning chamber.

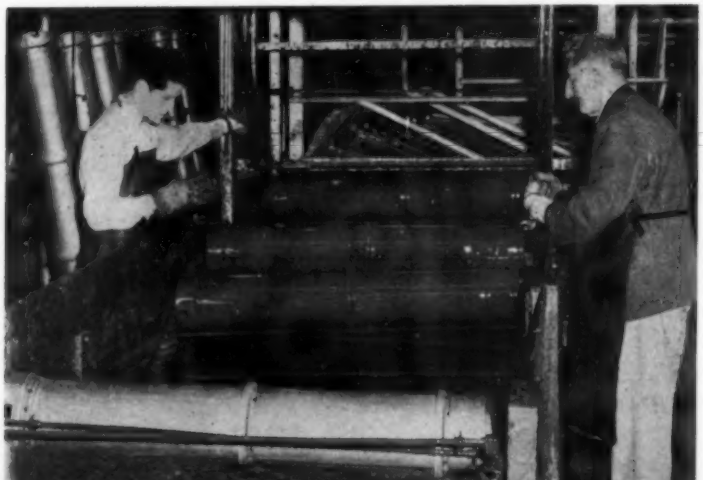
the cannisters continued onward through a spray rinse chamber.

The high temperature of the cannisters caused them to dry quickly after emerging from the cleaner. They were then transferred immediately to a second horizontal conveyor which carried them through a dip tank filled with highly rust-resistant, zinc chromate-based paint. As the cans emerged from the dip tank, they were tilted automatically in both directions over a drain table to remove excess interior paint.

Oven Drying the Protective Paint Coating

Without pausing in motion, the cannisters were carried onward and into a 90-ft. baking and drying oven. The trip through the oven required approximately 35 minutes. When the cannisters emerged from the oven, they were briefly inspected and immediately transferred to an overhead conveyor chain that moved them from the building out onto the loading platform. Workmen on the loading platform transferred the painted products directly from the conveyor into a waiting box car.

The advantages of continuous movement are certainly apparent. Manual handling is reduced to a minimum. The direct transfer of parts from one process to another eliminate the second handling necessary when parts are temporarily stored and then rehandled again when they are put in process. No



A cross-bar conveyor dip-coats the cannisters, then automatically tilts them for interior drainage. Conveyor continues on through drying oven.

End of the cannister line. These "cans" have not paused since entering the finishing department. They are now ready for loading into the waiting car.

space for temporary storage banks is required, as the parts do not pause in the department. Strict cleanliness is assured, as the products do not pause to gather dust, rust, or acquire other sorts of surface contamination.

Although this continuous method of finishing is not applicable to all production lines some of its features could be incorporated in many of them. Careful scrutiny of other processes developed during the rush of war years will indicate many innovations that can now be profitably adapted to peacetime production.

Synthetic Carnauba Wax

IT WILL soon be possible to secure production of synthetic carnauba wax in the U. S., according to a recent government announcement. The synthetic wax—manufactured on the basis of patented German processes now released to American industrialists—is reported to be equal to and, for many purposes, superior to natural wax.

Carnauba wax, now produced principally from the wax palm grown in Brazil, is used in the manufacture of floor wax and polishes, carbon paper, and leather finishes.—U.S.I. Chemical News.

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It's now easy to make a good-looking, long-lasting suede-like finish on wood, metal, wall board or other surfaces. The new Binks Model 171 Flock Gun does it quickly and easily. This improved gun has three adjusting valves—one to control the shape of the spray from round to flat—a second to adjust the air which goes into the cup to agitate the flock and carry the correct amount to the nozzle—and a third to control the "atomizing" air. Flock is available in various materials and in an extremely wide variety of colors. Write today for complete information.

Binks Model 171 Flock Gun with 1 qt. cup.....$25.00 • with 2 qt. cup.....$26.50

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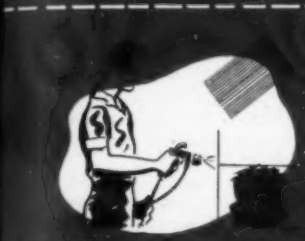
HOW IT'S DONE

CLEAN THE SURFACE

First be sure that the surface is free of grease. Dust can be removed quickly and thoroughly with a Binks Dusting or Blow Gun.



SPRAY WITH SIZING

A good coat of sizing or other sticky material is next applied with a Binks Model 7 or 19 Spray Gun. It should be uniformly spread.

SPRAY WITH FLOCK

While the surface is still sticky spray the dry powdered flock into it with a Binks Model 171 Flock Gun. See description to the left.

AND BEHOLD!

The result is a smooth suede-like finish, pleasing to the touch and to the eye. Can be used on postcards, toys, metal parts, etc.

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What's Wrong in Some Finishing Rooms

BY C. RAYMOND SYER

Consulting Finishing and Industrial Engineer

EVERY manufacturer is eager to have his products presented to the trade in an attractive durable finish. If he is experienced in manufacturing he knows that this calls for a well organized production setup and dependable personnel to man it. He knows too, that surface preparation before painting is as important as correct paint application and paint drying.

Regular inspections must be made to ascertain whether or not correct methods are being used all along the line set up for surface preparation, paint application, and paint drying. These regular check-ups and the prompt correction of any faults that may be discovered, will help to remove the causes of many failures in product painting and finishing. Remember, many paint or finish failures do not show up until after the product has left the factory.

Cleanliness Needed in Every Paint Department

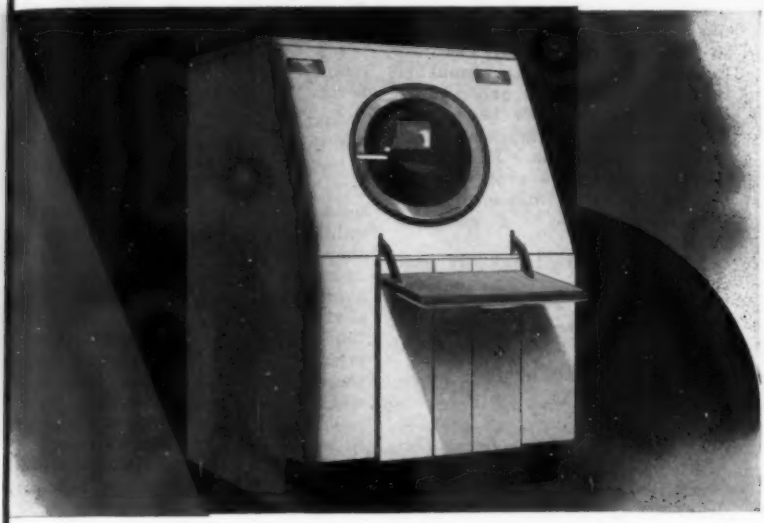
An important feature in connection with using all industrial paints and finishing materials is cleanliness in the department. Clean pleasant surroundings have a favorable effect on workmen. In a clean, well lighted, ventilated factory the employees feel more encouraged to do their bit toward helping to keep the shop clean, and they are more likely to strive to do clean top quality work. Shop cleanliness and proper ventilation stimulate mental alertness and encourage useful activity.

Safety receptacles should be placed in convenient locations for the disposal of all debris. Windows should be kept clean to let in as much daylight as possible. Floors and work benches should be kept clear of debris and surplus supplies. Clear, clean, passageways should be maintained and any work that must be temporarily stored should be piled in a neat orderly manner. Regular cleaning of all spray booths and ovens should be a "must" in every plant.

At regular intervals dust should be removed from all overhead equipment such as electric light reflectors, overhead conveyor lines and the roofs of ovens and spray booths. This dust can be removed with a large vacuum cleaner.

Check the Air Pressure; Strain Paint Materials

In several plants I have noticed that it is almost impossible to see what air pressure is being used; the gauges are covered with dirt and paint. Judging by their appearance this condition has existed for several months. The com-



Yes indeed it will — if Stanley chemists and the research brains of the appliance industry can produce it! The problem has always been to provide an exterior finish of extreme durability and a tub lining that would withstand the chemicals contained in washing preparations. We're still seeking to improve finishes which seem to be perfect . . . and the search will never cease! Perhaps you have a finishing problem more or less complex. Asking our advice incurrs no obligation. Write to the Stanley Chemical Company, East Berlin, Connecticut, manufacturers of Stanley Enamels, Lacquers, Synthetics and Japans.

Stanley Chemical

pressed air that is used for spraying is always an important element in the cost and quality of any finishing job. Gauges should be kept free from paint and dirt, so that the air pressure being used can be checked quickly and accurately at any time. Faulty air pressure will cause poor atomization of the paint, and may result in poor coverage or a waste of paint materials.

Where pressure tanks are used for spray painting, a wire mesh strainer should be included in the setup, to remove any possibility of dirt or small lumps of material entering the spray gun.

Fire Prevention Is Fire Protection

In reference to fire prevention, which is extremely important in every paint shop and finishing department, here are two things to keep in mind and act upon.

1) Interiors of spray booths, exhaust piping, fans and motors should be cleaned regularly.

2) Dirty and oily rags should be deposited in fireproof receptacles and removed from the department at the close of each working day. A ball of oily rags left under anything that restricts air circulation in a closed warm room, will often generate heat, start smoking and eventually burst into flame. This may occur at night or some time when no one is around to use the fire extinguishers—and a fire spreads very rapidly in a paint shop or finishing room.

I believe it is safe to say that the chief causes of most paint failures or finishing troubles are: 1) Improper or inadequate cleaning of surfaces to be painted; and 2) the use of an unsuitable sealer or primer coat. The primer must have excellent adhesion to the metal—and reasonable flexibility. If the foundation of a finish is slighted, the final coating may break down, regardless of its fine quality or any other factors in its favor.

Agitate or Stir to Mix Your Finishing Materials

Paints and enamels must be well stirred or agitated before they are used. Some of them need to be mildly stirred at intervals while they are being used. Mechanical agitators of various types are available for this purpose. Proper stirring or agitating will restore the original uniformity of any pigmented finishing material and thereby help to prevent troubles which otherwise would occur.

The type and quantity of thinner to be used in any paint or enamel is important. As for the type of thinner to use, the safest course to follow is to abide by the recommendation of the paint manufacturer. How much thinner to add to a paint or enamel is something that must be carefully worked out. It is generally based first on the manufacturer's recommendations, and second upon one's own experience. A good rule to follow is to use as little thinner as may be needed to bring the paint or enamel to correct viscosity for the kind of work being done.

Some Common Troubles and What Causes Them

Finishing materials that are temporarily stored, awaiting entrance to the finishing department, should be kept in a room in which the temperature never falls below 60° F. Cold materials will be high in viscosity, like "molasses in January", and will need a warm-up to condition them for use.

Orange peel effects on the final film can be caused by using improperly reduced material. Un-

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You'll like it's ease of application . . . the way it spreads—smoothly, evenly, with never a ripple to mar its sparkling "sales appeal" finish. And you'll thrill at the way PORCIFLEX cuts your finishing schedules DOWN, *down*, down! For here's *real* speed—a one-minute bake at 450° F, up to 15 minutes at lower temperatures.

How about it? Take a minute to jot a note. Just say "send Porciflex samples"—and we'll do the rest!

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ONE-MINUTE BAKE

"A SYMBOL OF QUALITY IN THE FINISHING FIELD"

balanced thinners tend to cause this trouble, as well as reduce the luster of the finish.

Pin holes may be caused by the presence of water or oil in the compressed air line that supplies the spray guns. Air lines and air-conditioning devices (filters, strainers, etc.) should be kept clean and in first class condition at all times. Moving the freshly coated work into a hot oven too quickly—before entrapped solvents can escape, as they would during a brief interval of air drying, or a slow warm-up before reaching high heat—is another cause of pin holes in the finish.

Faulty spraying is the cause of some finishing troubles. Materials should be sprayed wet enough to flow out smoothly. The spray gun should be directed straight (at right angles, or 90°) toward the surface being coated, and it should be held at a uniform distance from the work during spraying—say a distance of 7-in. to 12-in. Always use the lowest air pressure that will produce a smooth film of coating material.

The quality and appearance of the finished job depends on the care taken in the application of each individual coat of material. A series of carefully controlled operations will give a smooth satisfactory finish—provided everything else is just "right".

Color's Effectiveness in Industry

A RECENT SURVEY OF 46 different type industrial and manufacturing plants revealed that the scientific application of color has provided clean, wholesome, morale - building working areas within those factories. The natural result has been to remove one of the prime sources of industrial accidents.

Prior to the war, color was rarely conceded to be a safety or morale factor in industry. Paint was considered only as a preservative in the average pre-war plant. As a result, color often was so misused that it actually produced industrial hazards.

Most plant walls were painted white and the machinery a dull, drab gray. This combination of reflecting and absorbing colors robbed the worker of whatever illumination was available. Unknowingly, he was placed under mental and physical strain.

However, demands from the military services for unprecented amounts of war materials opened the way for the application of scientific color principles on a practical scale.

Seeking every possible means to produce a mountain of materials on time for the United States and allied military machines, production officials turned their plants over to the color engineers. As the shades of green, ivory, blue, yellow and other up-to-now interior decorators' colors replaced the traditional gray, white and black, a new and functional means of promoting industrial safety, and consequently increased production, was born.

One of the basic ideas of the principles of color dynamics is its use for identifying safe and dangerous areas of production machinery. By use of focal and eye-rest colors, each part of the machine is so treated that moving parts, switches, levers and wheels are spotlighted for the operator's convenience.

According to the assistant general manager of Arrow Metal

Products, Detroit, Mich., "The practice of painting vital parts of the machines in different colors has made operations much safer. Painting the handles ivory and switches orange has enabled our men to reach for controls almost automatically. We have also painted dangerous parts of the machines a bright orange so that the men are constantly warned away from the danger zone."

It is evident that the engineered use of color in industry for safety purposes is still in its infancy. As more and more plants adopt this method of styling their plants and equipment, safety engineers will discover new and different ways in which color can solve safety problems. These plants will find, as the others already have, that color dynamics can be used as a specific safety tool.—P.P.G.Co.

Cellulose Wrinkle Finish

THE MAJOR constituent of the cell wall of plant life is cellulose. For this reason, it is the most abundant of our natural organic compounds.

Industry obtains cellulose from varied sources: wood pulp from forests all over the world, Manila hemp and sisal hemp from leaf fibers, straw from wheat and rice, and seed hairs in the form of cotton and kapock fibers. Recently, use has been made of the seed hairs of the lowly milkweed.

It remained for modern science to define cellulose chemically as a polysaccharide and then carry on to develop several new products known as cellulose derivatives. Like the atomic bomb, the first cellulose derivative, nitrocellulose, was developed as a military weapon. The preparation of nitrocellulose in 1845 by Schonbein was followed by the development of celluloid, the first synthetic plastic. Further advances were given the proper impetus by the growing automobile industry, which has resulted in our present day lacquer industry.

The widespread use of nitrocellulose was followed by the commercial development of cellulose acetate and ethyl cellulose. Industry found uses for these organic derivatives outside the protective coatings field and now they are basic materials in the formulation of plastics, impregnants and adhesives.

New Wrinkle technologists, sensing the needs of industry, have been working on the development of a cellulose derivative wrinkle finish. The resulting compositions combine the advantages of a lacquer coating with the attractiveness of a wrinkle finish. Spraying, rolling, spreading or dipping methods may be employed. In either case, a coating of unique texture, high resistance to abrasion, extreme flexibility, and great beauty is obtained.

While not air-drying, these newer formulations effectively reduce drying time, as compared with finishes hitherto used on fabrics and paper. Infra-red and conventional ovens or tunnels may be employed successfully for baking and many textures may be obtained by varying the proportion and type of ingredients in the formulation.

In spite of these advances, New Wrinkle's staff is continuing its efforts. The goal is ultimately to produce a wrinkle finish having all the valuable qualities now available, plus others not yet attained. —*New Wrinkle, Inc.*

Blast Cleaning Metal Parts

WELL cylinders, with their plunger cages and connections, once were made largely of brass, but they are now being made of iron and steel by the Clayton Mark Co., of Evanston, Ill., pioneer manufacturers of water well equipment.

Both iron and steel rust and corrode easily, damaging the pipes and staining the water. But Clayton Mark engineers developed a special process whereby these cylinders will supply rust-free water. All iron parts are given a highly corrosion-resistant protective coating which is baked on the metal.

Both of the blast cleaning machines are ventilated with an American Dustube dust collector.

Clayton Mark plant officials point out that Wheelabrating does not change the shape or form of a part, nor even damage the threads which are cut on cylinder barrels before they are put into the blasting machine.—*American Foundry Equipment Co.*

Cleaning, Painting and Drying Setup

A TYPICAL conveyorized dipping, spraying and infra-red drying setup for small metal parts will probably include the following features: It can be designed for dip coating primer and spray coating over the primer, or for all spray coating, or for all dip coating as desired, according to the product to be finished.

The chain conveyor is suspended from the ceiling and travels through a dip tank and through a spray booth; then through a bank of infra-red drying lamps.

We will assume that the metal product is to be primed with a red oxide primer and then coated with a synthetic enamel. It can be done as follows:

First, the articles to be coated are thoroughly cleaned, either in a vapor degreaser or submerged in cleaning and rinse tanks. If the articles are small they can be put in or onto fixtures or racks, several pieces to the fixture, and these fixtures can be hung on the conveyor. The conveyor line takes them on through the dip tank of primer, which is a 2-minute flash-off material. By the time primed products reach the first spray operator, they are ready for the first spray operation which consists of a mist coat of synthetic enamel. Then to the second spray operator where the surfaces are given a good wet coat of synthetic enamel.

The mist coat is necessary in order to make it possible to apply a wet coat on the second operation without the material running —as would be the case if the mist coat were not applied first. Three or four minutes are allowed between the last spray operation and the infra-red heat bake. A 5-minute infra-red bake takes care of both the primer coat and enamel coat at one time, thereby saving the extra bake on the primer, as is necessary with some types of materials.

If the dip tanks are portable they can be moved out of the way when no dipping is being done, or if the primer coat is to be sprayed, as will be necessary on some articles. A small spray booth can be installed between the dip tank station and the first

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enamel coat spray booth. The primer will flash off in plenty of time to receive the first coat of enamel, which is the mist coat. From the time the products leave the infra-red bank until they reach the loading station they will be cool enough to be wrapped and packed.

The red oxide primer is applied very thin, but it gives full protection against corrosion and will adhere to such surfaces as cadmium plate, brass plate and zinc plate, and it flows out to a very smooth surface. It will stand the salt spray test, and makes a fine surface over which to apply the synthetic enamel.

The infra-red bank is equipped with 275-watt bulbs, which give the right amount of heat for baking white synthetic enamel made for this purpose. If colors other than white are used, they can be put through on the same schedule as the white synthetic enamel.

This is the quickest system of painting and baking that I know of, and it produces a very fine smooth and serviceable finish. Name of the manufacturer of material will be given on request. —F. H. COHAGAN.

Metal Finishers Association Active in East

Metal finishers in New England have been very active during the past few months in holding meetings which have been of definite value. The chief subjects for discussions at monthly meetings have been Price Ceilings, Labor Relations, Cost, and "The Value of a National Assoiation."

Under the heading of Price Ceilings, the entire industry, in cooperation with Associations in other sections of the country, has been lining up the proper procedure to convince the OPA that the industry has reached the point where competition will hold the general level of prices in line. Price ceiling controls should be aboiished. Four delegates from the New England area went to Washington to present to the OPA arguments for decontrol of Price Ceilings on the basis that competition will hold prices in line.

The New England Association is fortunate in having as its president R. Alfred Campisi, President of the Industrial Enameling Corp. Mr. Campisi is a keen analyzer of economic conditions. He has led the New England group through the current maize of Government restrictions and controls with an almost uncanny understanding of the needs of the industry.

A strong movement is on foot to organize a National Association of Metal Finishers. Several meetings have been held to bring together the various local associations throughout the country. It is planned to have a National Association represent the industry in those branches of management which require concerted over-all cooperation.

The address of Master Metal Finishers Association of New England, Inc., is 80 Federal St., Room 612, Boston 10, Mass.

L. C. Kroes Advanced by Detrex Corp.

L. C. Kroes has been appointed manager of the Central Regional Sales according to an announcement made by A. O. Thalacker, vice-president and general manager of Detrex Corp., Detroit, Mich., manufacturers of solvent degreasing equipment and chemicals, metal parts washers and Triad cleaners.

L. C. Kroes is Mgr. of Central Regional Sales for Detrex Corp., Detroit, Mich.

Mr. Kroes has been with Detrex Corp. since 1937, serving as a representative in the eastern region for three years when he returned to manage the Michigan Division in 1942. He is a graduate of the University of Michigan and is a member of the American Electroplaters Society. His headquarters will be in Detroit.

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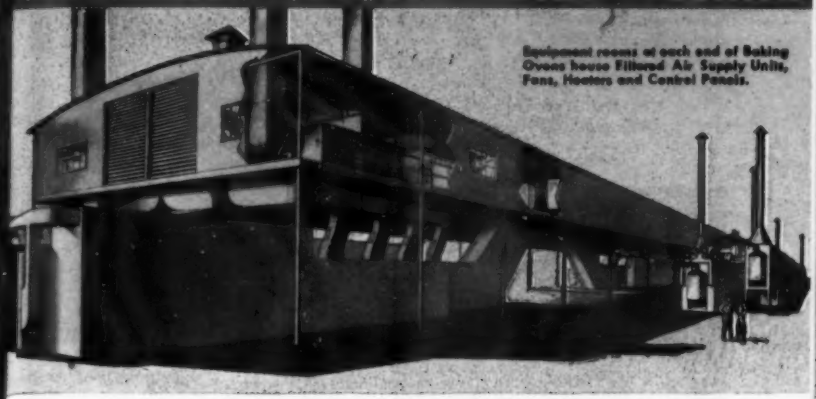

Equipment rooms at each end of Baking Ovens house Filtered Air Supply Units, Fans, Heaters and Control Panels.

. . . Here, is Typical Mahon Planning and Engineering

The Complete Finishing System Planned, Engineered, Fabricated and Installed by Mahon for the American Central Manufacturing Corp., Connersville, Indiana—an installation especially designed for finishing Refrigerator Cabinets and other Household Appliances—illustrates a few of the advantages of turning your complete finishing problem over to Mahon engineers. In this instance, the greater part of the complete system was erected outside of existing buildings . . . the entire contract—including necessary additional housing, which became an integral part of the Finishing System—was handled by the Mahon organization. This is typical of what Mahon engineers have done for hundreds of manufacturers all over the world . . . these engineers—pioneers in this highly specialized field, which covers every industry where Finishing constitutes a major production operation—are endowed with a wealth of technical knowledge, experience and practical know-how, not available to you elsewhere. If you have a finishing problem in your plant today, or are contemplating new equipment of this type, consult a Mahon engineer—no obligation.

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Engineers and Manufacturers of Complete Finishing Systems including: Metal Cleaning Machines, Rust-Proofing Machines, Dry-off Ovens, Hydro-Filter Spray Booths, Filtered Air Supply Units, and Drying and Baking Ovens. Also Paint Sludge Reclaiming Units, patented Hydro-Foam Dust Collecting Systems, and many other Units of Special Production Equipment.

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Lacquer Finishing

OF WOOD FURNITURE AND CABINETS

NITROCELLULOSE lacquers, once thought of as inefficient and impractical for quality finishing, have come a long way since World War I. Today, they have the qualities of better plasticity, durability and adherence, which are required for an attractive enduring wood finish.

Spraying from a cup gun. Photograph courtesy of The DeVilbiss Company.

BY CLARENCE PLAINWAY

Proper preparation of the wood before finishing begins, is of vital importance. We may assume or hope that the wood was well seasoned before it was machined. Otherwise trouble is going to show up when it does become thoroughly dry and adjusted to indoor atmospheric conditions. In furniture and cabinet work, preparation of wood surfaces for finishing will include sanding to make all surfaces smooth; and then complete removal of all wood dust—even from the pores of the wood. Wood dust isn't a good filler for pores in the wood grain. Removal of this fine light dust, produced by sanding, is often accomplished with an air gun which is connected by hose to the compressed air line.

Staining the Wood to Uniform Its Color

Staining the wood generally comprises the initial operation. Water stains and non-grain-raising stains give excellent results, and they are safe to use under lacquer. Certain other stains especially formulated for use under lacquer include pigment wiping, dipping and penetrating oil stains and lacquer shading stains. The older-type liquid penetrating oil stains, originally compounded for use under varnish, may cause slow drying and bleeding troubles when used under lacquer.

The drying time, following staining, depends upon the type of

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Numerous tests are now a matter of history. Customer approval is phenomenal, and repeat orders are pouring in.

If you haven't investigated these two new primers, we invite you to do so now!

- Zinc chromate base — highly rust resistant — withstands 30-day salt spray test.
- Very economical — reduce equal parts with Toluol substitute.
- High solids — excellent filling.
- Perfect base for lacquer or synthetic finish coats — ideal for automobile bodies, parts, steel sash, laundry and farm equipment.
- Apply dip or spray — excellent tank stability.
- Air-dry to recoat in 5 minutes — bake in gas, electric or infrared oven.
- Immediate delivery — write for further details, prices and sample.

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stain used, method of application (whether dipping, spraying, wiping, or brushing) and atmospheric conditions prevailing at the time of application. Modern non-grain-raising stains require only a few minutes to dry. Many times a good lacquer is unjustly or mistakenly blamed when the real reason for the finish failure is "not enough drying time".

Removal of Natural Color for Blond Finishes

Parallel to staining, as an initial operation in finishing, is the bleaching process, which has become increasingly popular during the past few years. Through bleaching, the natural dark color is "pulled" out of the wood surfaces *to prepare them for a blond finish.* For this work, there are chemical powders and solutions sold under various trade names. In nearly every instance the safest practice is to follow the manufacturer's directions to obtain the desired results. Before applying any lacquer to a bleached surface, it is essential to neutralize or remove any acid or alkaline deposits that may be present. After bleaching treatment some finishers wash the bleached surfaces with alcohol, allow the washed surfaces to dry for one hour, and again wash with alcohol.

Wash Coat; Light Sanding; Filling Open-Pore Woods

After staining or bleaching, the usual practice is to apply a "wash coat"; and when this is dry, sand the surface lightly with fine sandpaper. This "wash coat" may be a very thin lacquer or shellac having only 5% to 10% solids content. Its purpose is to provide for better filling and to prevent excessive darkening of the wood by the filler. A wash coat is not needed unless the wood is to be filled.

When the wood surfaces are properly stained, wash coated and sanded, they are ready for filling—if filling is required. Open grained woods such as ash, mahogany, chestnut, oak and walnut generally require filling; close grained woods such as maple, beech, birch, white pine and spruce, usually do not. The selection and correct use of a suitable filler is highly important. The newer quick-drying fillers, especially formulated for use under lacquer, should be employed for this work in preference to the older slow drying types of filler. When a slow drying filler is used, overnight drying is generally necessary to avoid such troubles as greying, and drying difficulties following the application of lacquer.

Preparing, Using and Drying Wood Fillers

Suitable reducing liquids for all paste fillers include VM&P naphtha, Sunoco Spirits, benzine and Varnoline. If it is necessary or desirable to slow down the setting up of the filler, some finishers add a small quantity of mineral spirits to the filler after it has been reduced with VM&P naphtha or benzine. White or lead-free gasoline is dangerous to use for reducing filler. It is slightly toxic and the vapor from it is a fire hazard; a concentration of vapor from gasoline needs only the slightest spark to cause an explosion or quick fire. The use of kerosene or any solvent that leaves a greasy residue will slow down the drying and probably cause fogginess and a whitish film.

Paste filler should be cut down to heavy varnish consistency (mix about 10 or 12-lbs. of paste filler to each gallon of solvent). It is usually brushed on with the grain of the wood and, after it has started to set, the filler is expertly padded into the pores of the wood,

Because Santocel, Monsanto's unique silica aerogel flatting agent, is both inert and inorganic, it produces clear matte finishes of exceptional film hardness that resist marring and show far less tendency to burnish than where ordinary flatting mediums are incorporated. Users of lacquer, synthetics and varnishes for flexible coatings, especially, find this quality important.

This mar resistance, added to six other important properties, is making Santocel the preferred flatting agent, wherever quality finishes are required.

Your letter will bring you samples and complete technical data on Santocel, write now to: MONSANTO CHEMICAL COMPANY, Merrimac Division, Everett Station, Boston 49, Massachusetts.

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and the excess material is wiped off across the grain. For wiping off the excess filler, finishers generally use burlap, sea grass or moss. This wiping-off of excess filler must be done carefully and skillfully to avoid tearing imbedded filler out of the pores of the wood. The across-the-grain wiping may be followed by the use of a soft clean cloth to gently wipe the filled surface clean with the grain.

Modern quick-drying filler—after the excess has been wiped from the filled wood surface—will air dry in 30 to 60 minutes, unless the drying conditions are very unfavorable. It can be force-dried in 5 to 15 minutes, under favorable conditions. One finisher declares he is using a filler that can be coated with sealer in five minutes, and that he has sealed hundreds of pieces in one minute after padding in the filler and wiping off the excess material. Slow-drying fillers, of course, may need several hours to dry properly. Filler, after it has dried hard, gives the wood a smooth level foundation for following coats of finish.

Sometimes a combination stain-filler serves the purpose in wood finishing, but the experience of numerous industrial finishers indicates that in the better grade of wood finishing, staining and filling should be separate operations.

Sealer Coat; What It's for; Drying and Light Sanding

A coat of "sealer"—usually lacquer sealer—has the following important functions: 1) seal the minute pores of the wood; 2) "seal in" the filler; 3) form a dependable bond between the wood and the following coats of lacquer. In custom finishing a thin coat of white shellac is sometimes used as a first coater; it is generally a 2-lb. cut (2-lbs. of gum shellac to one gallon of alcohol). All practical finishers do not agree on the wisdom of using even a thin coat of shellac as a sealer under lacquer. Many prefer to use lacquer sealer under lacquer intermediate and finishing coats.

Because the use of an incorrect thinner may affect the drying, flowing and leveling characteristics of any sealer, the correct reducing medium for the particular kind of sealer employed warrants this advice: "Follow the manufacturer's recommendations". One to two hours' drying time is generally adequate for most lacquer sealers, depending upon factory conditions that affect drying.

After a good sealer coat has become thoroughly dry, it can be easily sanded without clogging or "gumming up" the sandpaper. It produces a level, hard foundation for the following lacquer coats.

Lacquer Coats which Really Make a Finish

Having been properly stained, filled, sealed and sanded, the coated wood surfaces are now ready for the final lacquer coats—one, two, three or four, depending upon the depth of finish desired. Lacquer of dependable quality should be used. Properly prepared and sprayed, a fine lacquer flows out to form a smooth film of uniform thickness, and it dries quickly. It gives an attractive protective finish that has many desirable features.

Information about the proper reduction of lacquer for spraying, by the addition of suitable thinners, should come from the lacquer manufacturer or his chemist or service man. An experienced finishing foreman will know something about this too—through past experience. It is a matter of considerable importance and should not be left to guess work.

Best results from spraying call for the skillful use of equipment of recognized quality—equipment that is in perfect working condition, properly adjusted, and clean. The technique of correct spraying has been covered in several articles in this publication, so I will not go into it here.

How many coats of lacquer should be applied? Answer to this $64 question depends, in large measure, upon two factors: The quality of finish desired, and the kind of wood to be coated. Some woods need more coats of lacquer than others to show a good finish. If the final coat of lacquer is to be rubbed, to remove its high gloss and to give it a more professional appearance, then it must be given plenty of time to dry thoroughly before rubbing begins. This may mean two or three or four hours, or overnight air drying, although in some factories less time is allowed. Force drying will shorten the time, of course. Oil and pumice may be used for rubbing, although many finishers prefer to use water and pumice.

Rubbing and Polishing Final Lacquer Coat

A surface rubbed with oil sometimes shows up cloudy afterward. When water and pumice are used the rubbing goes faster and the final result is a clean clear surface. The use of wet-or-dry sandpaper with rubbing compound or water is gaining in acceptance in industrial practice. The rubbing can be done by hand or by portable power machines driven by compressed air or electricity. Intricately molded and carved surfaces are often "rubbed" first with a heavy short-bristle brush dipped into a thick soupy mixture of fine pumice stone and water or rubbing compound.

After all traces of rubbing have been removed—the rubbed surfaces being perfectly clean and dry—a thin coat of waterproof wax may be wiped on and rubbed or polished. In some factories this polishing is speeded up by buffing the surface lightly with a sheep-skin buffing disc driven by power.

Where it is necessary or desirable to dispense with rubbing, because of its high cost or because skillful rubbers are not available, but at the same time have a finish that will show a rubbed effect, the finisher can use a flat or rubbed-effect lacquer for the final top coat. Some furniture has only the tops rubbed; the remainder of the article is finished in rubbed-effect lacquer.

Founder of A. C. Horn Co. Continues Active

Mr. A. C. Horn was the founder and president of the A. C. Horn Co., Long Island City, N. Y., since its inception in 1897. In the later part of 1945 the Horn Co., (paints, varnishes, lacquers) became a Division of the Sun Chemical Corp. Mr. Horn is a Director of the Sun Chemical Corp., and continues active in the business.

Mr. A. C. Horn, President of A. C. Horn Company Division of the Sun Chemical Corporation in New York, N. Y.

The Sun Chemical Corp., 100 Sixth Ave., New York 13, N. Y., also includes several companies that manufacture and supply printing inks, (General Printing Ink, etc.) fine chemicals (Warwick Chemical Co., etc.), pigments and waxes.

Letters from Readers

Rust Remover Name

We are writing for the name of the rust remover mentioned in the article, "How We Solved Our Corrosion Problem," on pages 72 and 74 of the February 1946 issue of INDUSTRIAL FINISHING.—A.C.Co.

According to the author of the article the product, "Vincul" is made and sold by Protective Coatings Corp., Strathmoor Station, Detroit 27, Mich.

Finishing Furniture on a Conveyor Line

In the March issue of INDUSTRIAL FINISHING, on page 94, we notice an inquiry signed "V. Furn. Co.", regarding finishing on a conveyor line. This inquiry was the result of an article written by Walter C. Anderson.

For a number of years, we have produced wood finishing products for use in finishing furniture on a conveyor line, and are in an excellent position to advise regarding these finishes. If you will supply us with the name and address of this company, we will be glad to communicate directly with them.—THE LAWRENCE-MCFADDEN CO.

Information supplied.—ED.

French Polishing

I have been referred to you for information on French polishing. I am an amateur with little or no knowledge of what to do. Have you any booklet, or other compact form, in which you could send me this information?—B.W.K.

Mr. K, you are in for a lot of slow, hard work—hand rubbing with certain materials—to produce a smooth beautiful finish. It calls for much patience, perseverence and perspiration. In a letter we are sending you tear sheets of an article previously published on the subject.—ED.

Smoke Pipe Finish

We are making self-cleaning smoking pipes and have encountered difficulties with exterior finishing that seem to be considerably beyond our depth. We would appreciate very much indeed if you would make available any and all information you may have, dealing with wood staining in connection with the pipe industry, as well as finishing methods, materials and procedure.—F. S. PIPES.

In a letter we are naming a few concerns whom we believe can supply what you want.—ED.

Metal Cleaning Process

In the November 1945 issue of INDUSTRIAL FINISHING, I found the article entitled, "Cleaning, Conditioning Steel for Painting". This was written by A. P. Schulze. In this article Mr. Schulze describes the CrysCoat Process of metal cleaning. I would appreciate very much having the names of some of the firms using this method; also firms manufacturing this compound.—V.M.

The CrysCoat Process referred to by Mr. Schulze is a product of Oakite Products, Inc., 32F Thames St., New York 6, N. Y. A tear sheet of their advertisement on page 35 of February issue is being sent to you for your quick reference.

We do not know the names of concerns who are now using the process in production. However, we feel sure that Oakite Products will be glad to refer you to concerns who are using the CrysCoat Process.—ED.

Pressure Pot to Take One Gallon Can

We are seeking a pressure pot of sufficient size, having a top of sufficient diameter, to receive an ordinary one-gallon paint can. All of the pressure pots we have seen have a rather small cover and are used by pouring the paint into the pressure pot. This kind of pressure pot requires considerable cleaning when changing from one color to another.

By having a pressure pot of sufficient size to receive a one gallon paint can, it would not be necessary to wash the pot between colors, thus saving considerable time and the risk of mixing one color accidentally with another. It is not necessary that the pot be

PROTECTIVE COATINGS?

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"We've got a million of 'em"

A million? Well, not quite. Just the same you ought to see our files of coating formulas. Every kind of coating . . . for every coating purpose! Specialties, too, for very special and difficult jobs. Over the years, we've built up a reputation for developing finishes for some pretty tricky applications. Let us show how our know how can help you.

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LISTER AVENUE, NEWARK 5, N. J.

equipped with a pressure regulator for our use, because our airlines are already so equipped.—G.S. Co.

Try the spray equipment manufacturers who you see advertising in this magazine.—ED.

Tumble Finishing

We would appreciate it if you would forward us particulars of the method used for tumble finishing small metal parts such as metal corset fittings. Articles in your magazine indicate that this method is being used successfully in the states, and we are anxious to apply it in our finishing service.—KENFRED SERVICES, AUSTRALIA.

In a letter we are sending you a reprint of an article we published about Tumble Finishing.

Another, and perhaps better method of finishing the metal parts you mention, is a combination dip-whirling method. Machines for this type of work are illustrated in the advertising pages of this magazine.—ED.

Please send us a copy Robert Boon's article on "Tumble Finishing". We are extremely interested in small wood parts finishing and would appreciate your referring us to as many sources of information as you can.—C. FURN. Co.

Would you please send us six copies of your article on Tumble Finishing by R. J. Fairburn, which appeared in the September and October 1941 issues of INDUSTRIAL FINISHING Magazine?—T-H. Co.

Copies furnished.—ED.

Bake Finish for Aluminum Venetian Blind Slats

We have just run across the request of L.W. Co., on page 104 February issue of INDUSTRIAL FINISHING, asking for information on coating aluminum Venetian blind slats. We have a material especially formulated for this job; it bakes in one-half minute. We will appreciate your forwarding the name of this company so that we may contact them.—MONROE SANDER CORP.

Information supplied.—ED.

Furniture Finishing Information; Portable Rubbing Machines

A representative of the Thorp-Hambrock Co. of Montreal, Canada, on his recent call at our plant, drew our attention to a very interesting article entitled, "Finishing Furniture on a Conveyor Line", published in your December 1945 issue.

Another article of interest to us is entitled, "Finishing Maple and Oak in Blond Colors". We are wondering whether it would be at all possible for you to send us a copy of this issue for consideration?

In the article, "Finishing Furniture on a Conveyor Line", you speak about a portable rubbing machine. Would it be possible for you to furnish us with the name of the firm manufacturing these?—A. WOODWORK.

In April 1946 issue, which we are sending you, two manufacturers of portable machines each have a full page advertisement showing illustrations of their machines. Both machines perform satisfactorily.—ED.

Quick Drying Fillers Are Here

We are very much interested in the letter signed "H.D.", starting on page 100 of your April issue, about quick-drying fillers, as we have a filler that will do all of the things this man asks for. If you would be good enough to let us know who this is, we will arrange to give him a demonstration of a thoroughly practical filler that can be recoated in 30 minutes or less after being applied.—RELIANCE VARNISH CO.

Name given in letter.—ED.

Offer White Finish for Black Bakelite

In regard to the inquiry on painting black Bakelite white, as published on page 102 in the March issue of INDUSTRIAL FINISHING Magazine, we would advise that for some time now we have been manufacturing finishes to do this job for Bakelite handles used as stove and refrigerator hardware. Our finish for bakelite is of the thermosetting type, and because of this, is, we believe superior to a vinylite type of finish for the purpose.

We would appreciate it if you would inform the G.T. Co. of our background in this field and, should they care to have us work with them, we would be happy to do so. (Name withheld by request).

"Wage Incentives" Article Interests Executive

I was very much interested in the article, "Wage Incentives do Increase Output", on page 138 of April issue of INDUSTRIAL FINISHING, and would

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like to obtain more complete information on the incentive plan referred to. Is the plan available to others and, if so, will you kindly direct me to the right person or concern to contact?

It may be the answer to the prayer of many of us employers to meet the difficult problems confronting us in these unsettled times, and any assistance you can give will be highly appreciated.—W.C.D. (PRESIDENT OF MFG. CO.).

The author of the article stated that the Cleveland, Ohio company referred to is The Lincoln Electric Co.—ED.

Bleaching Article In Demand

We have just seen, in the March issue of the Canadian Woodworker, Edwin Hogstrom's article, "Suggestions for Securing Attractive Bleached Effects", which was originally published in February issue of INDUSTRIAL FINISHING.

Somehow or other, we missed seeing this in INDUSTRIAL FINISHING. We would like to reprint this article to send out on the many inquiries we get for information on bleaching. Therefore, we would be glad to have you send us the February issue of INDUSTRIAL FINISHING in which this story first appeared and to have your permission to reproduce it for the purpose we indicated.—MAHOGANY ASSOCIATION, INC.

Permission granted.—ED.

Glue that Will Penetrate Lacquer and Sealer

We are looking for a glue that will penetrate through lacquer and sealer. We are doing some prefinishing on certain items, and parts of them are being covered with sealer before they are assembled. Can you help us, or refer us to a company that can?—N.C.Co.

You might try "Ambroid", which is a liquid cement of nitrocellulose base. —ED.

Finish for Metal Tile

I am going into the metal tile business, which I was in before the war, and I would like to get a much better finish than I had before. My former finish was not good enough to stand the wear that a finish receives on the walls of a bathroom or around kitchen sinks, as the housewife uses different cleansers which rub off the finish. Have you a product with a plastic-base? Kindly let me know and I will send for a sample to try.—W. D., Toronto, Ontario, CANADA.

When you look through April issue, which we are sending you, we feel sure you will find advertised a number of finishes that will meet your requirements perfectly.—ED.

Comment on Varnish vs Lacquer Finishing

Dear Mr. Adams: I have just read your article on "Varnish vs. Lacquer for Furniture Finishing" in the March issue of INDUSTRIAL FINISHING. I think you make an excellent presentation of the subject and an exceedingly helpful one, although I cannot claim to be closely in touch with furniture finishing.

You point out, among other things, that lack of accepted standards of quality for furniture finishes makes it hard to establish a reasonable basis for comparing lacquer and varnish finishes. Later you point out that the furniture industry generally uses cheap quality finishing materials made to fit production schedules and costs, rather than long life, and you close with a plea that furniture makers give finish manufacturers the chance to furnish high quality finishing materials. I think your point is excellently taken.

If I am not mistaken the key to the situation goes back to the absence of standards of quality for finishers. If there were, let us say, a "Bureau of Standards" Commercial Standard for Furniture Finishes of high, medium, and cheap quality—something analogous to the present standards for "exterior type", "concrete-form type", and "water-resistant type" of Douglas fir plywood, and if the standard were marked on the furniture on the sales floor in some convenient way, I think that the extra costs of better finishes would prove readily recoverable in the sales price. Efforts to set up such identification of quality finishes, I believe, have already been made by some furniture manufacturers, but they failed largely because the paint industry did not participate in them. The problem necessarily requires cooperation by substantial proportions of both the paint industry and the furniture industry.

I understand that the paint industry has long done a fine job in discouraging commercial bribery in the furniture finishing field, but it has been traditionally opposed to standards for its products or their use. Several arguments are commonly advanced against standards, but I think the answer to them is plainly set forth in your statement of the prevalence of low quality rather than high quality. The same situation prevails in many

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No Rubbing Necessary

QUALALACQ RUBBED EFFECT 755

—produces the desirable rubbed finish without the labor of rubbing down. Qualalacq Rubbed Effect 755 has all the basic qualities of hardness, texture, flexibility, durability and will do the job in one operation. Qualalacq Thinner 631 is recommended as the most suitable thinner for this lacquer.

BRUSH OR SPRAY

QUALALACQ DULL 288

—will save your energy. It has been specifically formulated to meet the requirements of economical production. Quality and superior working properties are the prime assets of this lacquer. To eliminate the labor of rubbing down a gloss finish, a final coat of Qualalacq Dull 288 will give that hand-rubbed effect. Use Qualalacq Thinner 520, for the best results.

QUALALACQ NO-SHEEN 799

—is a dead flat finish, developed and formulated to produce an economical, production line finish, possessing no gloss. Qualalacq No-Sheen 799 dries hard, permanent and gives the fine appearance necessary for salesroom appeal. For the best results use Qualalacq Thinner 631.

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other paint fields such as red barn paints and flat wall paints.

I think that careful consideration points unmistakably to the conclusion that the establishment of sound standards of quality and their identification to the buyers of the finished products would increase the market for finishing materials of better quality. Further, I think our system of classification for house and barn paints shows that suitable standards can be devised, even for the complicated products of the paint industry, without restricting the formulator's freedom of choice or hampering development of new products.

At any rate I am convinced that the initiative for raising standards of quality of paint products should come from the technical men of that industry. The cure for price-mindedness is to give the concept of quality definite form and shape, recognizable by the man you expect to pay for it. Goods displayed in transparent wrappings usually sell better than goods hidden in opaque, sealed packages. I hope you will continue to consider the problem of favoring better quality, and stimulate your Federation members to do likewise, because I think they have the power and the responsibility to bring it about.—F. L. BROWNE, Chemist at Forest Products Laboratory.

Independent Oven Engineer

I am in the process of establishing a special paint spraying and finishing business. I am interested in learning if you are in a position to recommend someone, who may be strictly impartial, to advise me regarding construction of a gas-fired oven, for baking special enamel finishes. I have constructed an oven of cinder blocks, with inside dimensions of 14x12x8-ft. I have received the burners and air-mixers, and am waiting for delivery of the solonoid valve and temperature control.

It is my desire to obtain impartial engineering information regarding the construction of the sheet metal ducts, and ventilation for semi-indirect heating, and I may possibly consider indirect heating.

I am a veteran and do not have unlimited funds to spend a great amount of money for a pre-fabricated installation. Every person I talk to recommends only their own elaborate and expensive equipment, and condemns my conservative ideas.

Should you know of an individual or organization in this territory (Philadelphia, Pa.) who is qualified to render some assistance to me, I would greatly appreciate it.—C.S.C.

In your large city there are probably many engineers competent to supply the information you want—but unfortunately we do not know them. While the equipment you plan to install may be low in first cost, there is the possibility that it may be unsatisfactory and expensive in performance. Usually, when you fix up something more or less "home made", it is your own responsibility as to whether or not it will work—or how well it will work.—ED.

Roller Coat Machine

We would appreciate it if you would send to the attention of the writer the names of four or five manufacturers of roller coat machines for top coating.—D.G.Co.

Try the following:
Black Brothers Co., Mendota, Ill.
M. D. Knowlton Co., Rochester 14, N. Y.
There are others, but we do not hear from them any more.—ED.

"Centrifugal Painters"

Kindly advise us the address of the concern manufacturing "Barrett Centrifugal Painters."—L.Co.

Perhaps you have in mind the L. J. Barrett Co., 1498 Grafton Rd., Worcester, Mass.

A similar machine, the "Speedip" whirl enameler, is manufactured and sold by Ronci Machine Co., 2 Atlantic Blvd., Centerdale 11, R. I.—ED.

Decorative Finishes

We have just read an article by A. P. Schulze, entitled, "Greater Eye Appeal Through Decorative Finishes", in the February issue of INDUSTRIAL FINISHING. We are interested in learning the name of the manufacturer of "Multiform", "Mir-A-Tex", and "Poly-Veil" finishes.—BETTER PACKAGES, INC.

The finishes named are products of Berry Bros., Detroit 7, Mich.—ED.

We Make "Ambroid"

With reference to the item entitled, "Who Knows Ambroid?", published on page 96, March issue of INDUSTRIAL FINISHING, the name Ambroid is a trade name registered in United States and Canada patent offices. The product is a liquid cement of high quality, nitrocellulose base. It has been on the market for 36 years. The name is also used for other lacquer products marketed by us.

Ambroid Cement is widely used for just such purposes as your inquirer

Effectiveness...

Effective lighting makes a big difference in the eye-appeal of these photographs, and an *effective finish* makes a big difference in the buy-appeal of your product. If you are of the opinion that your merchandise needs "that extra something" to accentuate its trim lines and design, call upon the artists in our Creative Studio to conceive an arresting finish that will stimulate its sales-appeal.

Send us a sample of your product . . . after we finish it for you, you will see what we mean! Reputable firms are invited to take advantage of this service at no cost or obligation.

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ROCKFORD ILLINOIS

Manufacturers of Protective and Decorative Coatings

asks about, and it enjoys a reputation second to none.

You might inform your inquirer that a complete stock of Ambroid Liquid Cement is carried in Milwaukee by the Upholstery Supply Co., 1033 N. 4th St.—C. & S. C., 305 Franklin St., Boston 10, Mass.

Primer for Stainless Steel

We have always read INDUSTRIAL FINISHING and are wondering whether you have ever had any experience with painting stainless steel. We are looking for a primer particularly suited for stainless steel and, no doubt, regular finishes for paint to be used over a suitable primer. The stainless steel has a 2B finish and is reinforced with mild steel channels.

If you are in a position to suggest a particular type of priming paint, we would greatly appreciate hearing from you by early mail.—F.Mfg.Co.

We do not happen to have in mind a particular material for this special purpose at the moment, but feel sure that several of the concerns who advertise in this magazine can supply a satisfactory material, once they know your exact requirements, conditions, etc. In a letter we are suggesting a few of the companies who can probably furnish what you want.—ED.

Certificate of Appreciation Awarded to Schumann

Carl J. Schumann, president of the Hilo Varnish Corp., Brooklyn, N. Y., has received from the War Department a Certificate of Appreciation "as a token of gratitude for contributing valuable advice in connection with research and development work on protective coatings during the period of World War II."

Fluorescent Products

Continental Lithograph Corp. has recently concluded an agreement whereby the Switzer Brothers, 1220 Huron Road, Cleveland 15, Ohio, will supply the trade with many fluorescent produts formerly merchandised by Continental. With an accumulation of experience going back several years before Pearl Harbor, plus intensive work in the application of luminescence to the winning of the war, Continental Lithograph Corp. is going ahead with its program of continuous development and research in the field of fluorescence, as applied to the graphic arts.

Blast Cleaning Castings

BY MEANS of Tenite plastic pellets, an oxide surface smut is blasted from optical instrument parts. Blown from an ordinary blasting machine, the pellets remove completely the minute particles of dust which are given up through the pores of sand-cast aluminum-alloy castings, and which otherwise would interfere with the accurate functioning of powerful optical intruments.

This method of cleaning seems to draw out the dust, rather than pound it in, imparts a satiny finish

Tenite plastic pellets are used in this blast-cleaning operation.

to the metal without abrasion, and is quicker and economical.

The Tenite pellets employed for this purpose are similar to those supplied regularly to the plastic molding industry, although slightly smaller. As blasting agents, they have also been extensively used in the blasting of carbon from airplane pistons.—EASTMAN.

A=M
FINE FINISHES SINCE 1898

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A great name in paint making

AMERICAN-MARIETTA COMPANY
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Questions and Answers

Painting Recessed Letters

We have the problem of wiping paint into recessed letters on one of our electrical appliances. We followed the instructions given in the article written by Mr. C. Raymond Syer in your February 1946 issue, but we cannot seem to wipe the excess off the high surfaces without removing paint from the recessed letters. The letters are approximately .007 to .008-in. deep in aluminum, the whole surface of which is painted black first.

If you have any suggestions as to the technique we might use, we would greatly appreciate hearing from you.—Q. Corp.

You may need to fix up a little silk-covered pad to use for wiping away the excess paint that gets onto raised surfaces which adjoin the sunken letters you have just painted. Shape up a softwood block of suitable size and form to be handled easily in one hand—one that can be easily "rubbed" over the area adjoining the sunken letters. Instead of being flat, it may be better to have the block slightly convex or curved more or less like the rocker of a rocking chair—curved in one direction but straight in the other. The face of this block should have a piece of thick cloth or thin felt stretched over it and made fast. Then over this cloth or felt, stretch and make fast a piece of natural silk. The reason for using silk is that it "cuts" sharply and has no lint or extended fibers to drag the color out of the letters, but it must be stretched and held tightly over the wood block. The silk should be moistened with paint thinner before being used.

The idea of using the silk covered block for wiping is to have something that will not press into the sunken letters and remove fresh paint from them.

If this doesn't work, you will probably have to spray the letters through close fitting stencils—perhaps like those that are made and sold by Conforming Matrix Co., Toledo, Ohio.—ED.

Crystalline Snow Effect

Referring to an inquiry under the above titles, on page 106 of April issue of this magazine, I have produced this type of finish as follows:

First, spray a coat of slow-setting white lacquer or synthetic enamel. Immediately after, and before the coat has set up, spray on a coat of silver coated metallic sparkles, or a coat of cellophane spangles. Use a flock gun for the second operation. These sparkles or cellophane spangles are course powders. After the finish is dry, dust off the articles with compressed air, using low air pressure; this will remove the surplus powder.

The white enamel should not be sprayed in the same booth as the powder spraying operation. The booth for spraying the powder

New-type Finish

Like SUEDE • VELVET • MOHAIR • CARPET • ETC.

Flock

APPLICABLE TO ALL MATERIALS — AVAILABLE IN ALL COLORS

BOOK TELLS ALL

FUNCTIONAL USES

Used in the auto, airplane, radio, electrical, phonograph, ceramics, furniture and many other industries for surfacing all sorts of materials to provide

SOUND DEADENING • TEMPERATURE INSULATION • INTEGRAL GASKETS • SHOCK ABSORBING SURFACE • NON-MAR SURFACE • NON-GLARE SURFACE.

DECORATIVE USES

Applied in various lengths and colors to wood, paper, cloth, metal, etc., the following effects are produced—

SUEDE LEATHER • FURNITURE UPHOLSTERY • INTERIOR AND DRAPERY FABRICS • VELVET • VELOUR • MOHAIR.

Rayco Flock consists of particles of rayon, cotton, hair in all colors and in various lengths to produce effects such as suede leather, velvet, velour, mohair, felt, carpet, etc. Can be applied over entire surface, or to selected portion of article. New book: "Surface-Coating with Flock" gives actual swatches and a wealth of data.

REQUEST: "SURFACE COATING WITH FLOCK"

RAYON PROCESSING CO. of R. I. INC.

55 TREMONT ST., CENTRAL FALLS, RHODE ISLAND

should be screened in order to save the powder that does not stick to the enamel, so the powder can be saved and used again.

I believe this will do the job, and is only a 2-coat operation.—COHAGAN.

Trouble in Finishing With Lacquer

We have a finishing problem in our paint department. We would appreciate it if you would bring this problem to the attention of anybody who could possibly help us, by printing same in INDUSTRIAL FINISHING Magazine, and also contacting any specialists in this line.

In the finishing of our merchandise we apply two lacquer undercoats mixed with a lacquer thinner, a coat of glaze (colors in oil with the oil having a linseed base, mixed with a fast mineral oil spirits reducer) and a clear gloss lacquer top coat reduced about 10% with a lacquer thinner.

We find that the article, upon drying, becomes white from precipitation of cotton from the clear gloss lacquer. This precipitation takes place in anywhere from 4 to 12 hours. The only thing that we can do is reshoot the pieces with a second coat of clear gloss lacquer; this eliminates the precipitation. We find that this extra operation completely upsets our production line and is very costly.

This precipitation takes place during humid weather and is most noticeable in the corners and around inlays, with a good percentage of it showing up on large flat surfaces.—E. Mfg. Co.

Your problem seems to be directly traceable to the glaze, as you are now using it. Why use oil colors and reduce them with mineral spirits, when any good stain house will make a glaze of any color match—one that will dry for recoating within practically any time you specify?

Reason for the reaction of cotton (nitrocellulose) in the top coat of lacquer is caused by the oils and volatile solvents in the glaze not being properly dry. When a coat of lacquer film is applied over the unoxidized (incompletely dry) glaze the oil surface, not being miscible with lacquer, "shocks" a portion of the lacquer and turns it a milky white color.

The condition will be more noticeable where the glaze is left on the piece in greater concentration, or on the end grain wood where the glaze has penetrated deeper and consequently does not dry as rapidly as on a large flat exposed surface. The trouble will probably be more noticeable in damp or humid weather.

There are a number of ways to correct the condition, and also ways to prevent it. First, and I believe the best, is to have the glaze made by a good stain house —made to your specifications; then reduce this prepared glaze with a reducer specified by the manufacturer.

Second, if you do not care to do this, use colors ground in japan instead of in oil. Then you will have a faster drying glaze because of the dryer action of the japan in the color, provided you do not use, as a reducer, a solvent that is too slow in evaporating. I would not recommend mineral spirits. Instead, I would use benzine or VM&P naphtha. I would only add some mineral spirits if the glaze sets up too fast.

Third, use a top coat of lacquer that is rich in high-boiling solv-

BLEACHES

- Partial or complete decolorization
- Bleaches previously stained woods
- Non-destructive to wood structure
- Creates "Old World"—"Blonde" —"Wheat" and "Aspen White Effects"

Decolorant

FOR PARTIAL DECOLORIZING—apply one coat of Behlen's Decolorant. After four hours apply second coat of Decolorant if further bleaching is required. Decolorant bleaches the dissolved color deposits.

Color Dissolvent

COMPLETE DECOLORIZING—Apply one coat of Behlen's Color Dissolvent. After several minutes follow with a coat of Behlen's Decolorant. Color Dissolvent "brings" to the surface the natural wild color deposits.

Aspen Concentrate

FOR WHITE ASPEN EFFECTS—Apply one coat of Aspen Concentrate. Wipe with clean rag, follow immediately with coat of Decolorant. For further decolorizing; after four hours apply second coat of Decolorant.

Write for information and quotations.

Hardwood Finishing Headquarters Since 1888

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ents; or add a small amount of good lacquer retarder to the last coat—about two to four ounces to the gallon. This will have a tendency to absorb a greater amount of the unoxidized oils; it will slow up the drying rate of the lacquer film, and as a result this film will not "shock" as easily as before.

To throw back and to correct the condition after it has happened, spray the piece with a mixture of ½ retarder and ½ lacquer thinner. Do not use a lacquer coat. The solvent action of the thinners in an added coat of lacquer will soften up the previous coat of lacquer and the objectionable whiteness will disappear temporarily; but it will usually return when the lacquer is dry. This happens because, although the lacquer solvents did correct the condition temporarily, the rapid rate of drying of the lacquer did not let the solvents penetrate far enough into the "shocked" portion of the last lacquer coat.

It is better to spray on a mist coat of lacquer thinner or lacquer retarder, or a mixture of both. Let dry for a few minutes and then spray on a coat of lacquer that has been retarded.

If you still insist on using oil colors for glazing, you should secure a small amount of japan dryer, or better still get a good chemical dryer from your supplier, and when mixing the glaze add an amount of this to the glaze mixture as recommended by the supplier. This will hasten oxidation of the oily film.—EDWIN HOGSTROM.

I think that perhaps you are not allowing enough time for your glaze coat to dry. Glaze of the type you mention usually requires an overnight drying. It must have time for the oils in the glaze to dry out; otherwise these oils will cause precipitation of the lacquer top coat.

If you don't have time in your production schedule to allow the oil base glaze to dry overnight, or perhaps force dry it for three or four hours, then you should use one of the synthetic fast-drying glazes. One concern has a glaze called "Speed Glaze" which can be coated over with lacquer immediately after application—while still wet—without precipitation of the lacquer top coat.

There are also several lacquer sealer glazes on the market. These glazes have a new type of pigment. Perhaps you could use this glaze instead of your second coat of lacquer sealer, and thereby combine your second sealer coat and glaze coat in one operation. Then you could sand the surface lightly, if necessary, and follow up with your regular top coat of lacquer. Aside from saving labor and materials, this would accelerate your finishing schedule.—H.W.CHESTER.

Tumble Finishing Problem

We have some problems in finishing which we have not been able to solve. First, we have tried to get a high gloss finish in our tumbling barrels on wooden balls. Up to now we have used colored lacquers and wax. With these materials we have obtained a satin finish. What materials should we use and how shall we use them to obtain a brilliant luster?

Our second problem in tumbling is caused by the tendency of small flat blocks of wood to stick together in the tumbling barrels and to dent each other in the process of tumbling. We have no baffles in our

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NEW YORK BUFFALO CHICAGO
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tumbling barrels and wonder if putting them in would keep the wood blocks separate and free from nicks?—T. & N. Co. (Chicago).

---

1) Wax does not impart a high luster to wooden pieces finished by tumbling. I suggest a cellulose tumble polish, for instance, Zapon No. 3045. If it is applied a little at a time until the work is all covered, there should be less adherence of one piece to another.

2) You mention some pieces becoming dented. This leads me to believe that you are tumbling soft wood. If so, you do have a problem, as soft wood never lends itself to good tumble finishing. One solution to tumbling soft wood is to run the barrel only the two or three minutes required to evenly distribute the finish; then dry the base coat before polishing.

3) If the base coat is causing flat pieces to stick together, it may be well to add only a little lacquer at a time. The intervals between adding quantities of base coat should be short enough so that the previously applied base coat will not become dry. It may help to put a few heavier chunks of wood (tumble jacks) in with the work. I suggest trying 6-in. lengths of 2x4-in. pieces.—R. J. FAIRBURN.

---

1) Use high-gloss lacquer on this. Do you use a steel drum for finishing, or wood? A steel drum should give a good gloss finish. If you are using a wooden drum, you must get an air-drying colored oil enamel. Are you baking or air-drying the work?

2) Since I do not know the size of the pieces being tumbled, it is very difficult to suggest a remedy. Here is one of the problems to be solved in tumbling. Baffles in the barrel won't help. What I used to do was to gather some old small turnings and put them in with the work. This would stop the denting. Also, the whole operation should be slowed down so as to not tumble too fast. Add enough finishing material at first and don't run too long before inspecting this run. Here again, I would use pigmented oil air-drying enamel.—R. BOON.

We have never attempted to put a high luster finish on wood balls by tumbling. We find that we can purchase 1-in. diameter painted (high-luster) balls for between ¼ and 1/3 cents each from the little home work shops in Maine. This is cheaper than we can make them.

In regard to small flat blocks of wood sticking together and becoming dented during the tumbling operation, the placing of small (3/16-in. to ½-in.) wood balls into the barrel will alleviate this condition. Their presence keeps the stock rolling around in the barrel, and speeds up the drying and waxing process. The balls can be inserted at the beginning of the tumbling process. The only precaution to take is to have separate colored balls for different colored work. These balls can be purchased from the Lupomatic Tumbling Machine Co., New York, N. Y. About a pailful of balls will do the trick.—KARL SCHAAF.

Varnish vs. Lacquer for Furniture Finishing

I have read the article, "Varnish versus Lacquer for Finishing Furniture", written by R. C. Adams in your March issue and I must say, as a foreman finisher, that it was a well written and is a very fair article. Many years ago, I wrote

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The modern liquid treatment for water curtain type paint spray booths

No more fouling of booth sheets, nozzles, circulating lines and ventilating ducts!

SPRA-KLEEN solves paint overspray problems. THE ONLY PRODUCT OF ITS KIND, because . . . it DEFINITELY CONTROLS objectionable FOAM—and ELIMINATES the usual MANUAL EFFORT required to REMOVE SLUDGE.

HARCO SPRA-KLEEN has been used—and found indispensable, by many of America's greatest industrial concerns.

- Saves Labor
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in this book about the old method of finishing by varnish, and stated that I preferred the varnish finish. Well, one of your readers came back at me with guns loaded, scolding me for the article. At that time I was working for a manufacturer who advised me against writing anything further, so I let the matter go by.

But going back to the days of 1921, I was finishing carload lots of dining room and bedroom chairs for an eastern concern who sold the finished chairs in Boston. At that time my finish included the following:

Water Stain
Substitute shellac
Gloss Varnish
Dull rubbing varnish

This finish was allowed to dry 48 hours. Then I had the chairs rubbed with crude oil and pumice stone. At that time, this work was being done at a contract price and *I had to get the chairs out as cheaply as possible.* This gave us a very good finish. so I was favorable to varnish.

When lacquer was introduced to the furniture trade it was a step in the right direction for a speedy finish. My employer asked me what I knew about lacquer. I told him, "Nothing", but I added, "Let's give it a trial".

First we used all of our stock of varnish. Then I started with lacquer sealer. This I found to be excellent. It sanded beautifully and dried dust free. This material had a big advantage over varnish. The gloss and the semi-gloss lacquer gave us a nice finish. We figured the cost against varnish. *My boss said the cost of lacquer was too high.* We tried the non-royalty lacquers but these did not work out so well as the royalty high-solids material. We went back to varnish again.

The trouble with most finishing rooms is that the foreman has to keep the cost down in this department. I feel that many foremen don't do their best work because of this restriction or bottleneck, or whatever you may call it.

After working for that concern for seven years I thought I would look for something better. I left the company and went to work for a folding chair concern. This company had a beautiful finishing room equipped with fireproof spray booths and they were using royalty lacquers. We turned out 2000 chairs a week. Here was a company that specialized in the use of lacquers and made a success in this type of work. I received good training with this fine company and after eight years with them I looked for something different in the finishing game.

I went to Boston and took a job that included finishing custom-built furniture and reproduction work on antiques. My experience in spray work and standard finishes, also brush work, helped me a little in this line of work, but I found I had to learn finishing all over again. *The cost of finishing this work was no object, provided you did a good job.*

This finishing is done by padding. The polishing technique was brought to America by British, German and Italian workmen who learned their trade in their respective countries where they served over five years doing nothing but this type of work.

I found that these men specialized in French polishing and straight shellac finishes. The woods used here were genuine mahogany. The grain of these woods must be filled by your pad of shellac. This genuine shellac we mixed ouselves, with alcohol. The stains used were

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NEW PERIOD LACQUERS
ARE ATTRACTIVE & DURABLE
"A thing of beauty is a joy to behold"
New Period Lacquers produce a beautiful finish that is durable and withstands normal abuse. They are easy to apply and help to speed up production schedules. Manufacturers who are interested in a better finish at low cost are invited to try New Period Lacquers at our expense.
The complete New Period line includes sealers, gloss, semi-gloss, clear and pigmented lacquers. They are formulated for various methods of application and for any production setup.
A production sample, at our expense, will convince you of its superiority.
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chemical — bichromate of potash and sulphate of copper. Having added this work to my knowledge of finishing, I moved on into the tumble finishing field. — ROBERT BOON.

Lacquer Dipped Chairs

In dipping small chairs we have not found it possible to get a good luster or a good build-up of material without runs, by using lacquer. Can you make any suggestions or suggest any sources of information?—X.Co.

I don't believe you can get a high luster finish when dipping in lacquer, or a good build, unless you are using a close grained hardwood such as maple. Even then, to get a really good job, three coats should be applied. The difficulty in dipping with lacquer lies in the fact that the finished surface usually dries before all of the excess lacquer has a chance to run off, therefore excess lacquer piles up.

Service men from the lacquer manufacturer helped us lick this problem by advising the use of retarders and slower drying thinners, and by constantly checking the viscosity of the lacquer in the dip tanks. The best-bodied and sagless finish by dipping can be had by using oil enamels. The surface of the enamel coating being applied stays open longer and permits all excess material to run off. At times we use a lacquer-type undercoat (to give speed) and an enamel top coat to give us the quality finish. This might be the answer to your problem.—KARL SCHAFF.

For your dip finish on small chairs, I suggest a high-solids, low-viscosity lacquer. It will need to be reduced with a dip thinner to give it the proper "flow". Two coats of this lacquer, steelwooled between coats should give a satisfactory finish. For a smoother job, a coat of lacquer sealer may be dipped and then sanded or steelwooled.—R. J. FAIRBURN.

What is happening here is that the lacquer is drying too quickly. In order to stop the runs, this coat will have to be dipped very thin, or use a brush to take off the runs. Now to solve this question, why not buy a good dipping enamel, and hang these on the dip rack one or two ways in order to stop running? You may use a brush here to take off the runs. This should be no problem to a practical man. All finishers watch their lacquer dipping very closely. If this company is finishing in a natural or V.O.W. [varnish on wood], use a good varnish.—ROBERT BOON.

Tumble Finish; Wax

I noticed in one of your articles on tumble finishing that the writer suggested a finishing coat of carnauba wax or polishing wax in the same drum where the enamel finishing was originally applied. Wouldn't the wax left in the drum affect adversely subsequent lots of enamel?—A.N.

I have seen wax used in a lacquer tumble barrel, with no effect on subsequent tumble coats. Personally, I prefer a cellulose-base tumble polish, such as Zapon No. 3045. It imparts a high luster. —R. J. FAIRBURN.

I don't remember suggesting using the same tumbling barrel for

For your cabinet work and fine woods

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WEAR MASTER FINISHES

Their excellent working qualities are a STIMULANT to lagging production schedules. They work the way foremen want them to work!

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Mahogany, Walnut, Maple, Oak and other popular colors. These stains give attractive coloration and uniformity to woods that are deficient in these qualities.

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Excellent sanding qualities. Forms a perfect bond for succeeding coats and contributes to a film of lasting beauty.

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A high solids top coat lacquer with exceptional cold check resistance. Good build and flow make this lacquer outstanding for quality furniture finishing. Available in gloss or dull sheen.

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TRIAL SAMPLES

Available on request. WEAR MASTER Stain in standard shades or in selected colors to your order. The properties of the Lacquer and Lacquer Sealer may be altered to meet specific requirements.

EVANSVILLE 4, IND.

waxing; but this would be no problem for me. For polishing with wax, 1) Select a tumbling drum and wash it out with Sun oil spirits or VM&P naphtha. Then rotate the drum a few minutes to dry its interior surfaces. 2) Load the drum with enameled products; then throw in several pieces of wax. 3) Start the drum going. This load will be a little slow to polish because you must allow time for the interior of the drum to be waxed. You will find the next load will polish much quicker.

I have never had any trouble by using a wax drum for oil enamel finish. This company may be using synthetic enamels for tumbling, or a slow-drying lacquer finish. But my answer is "No" for baking oil enamel. I must know what this company is finishing before I say more.—ROBERT BOON.

Fire Protection Association

Fifty years ago a small group of public spirited New Englanders met after work in a small Boston, Mass. office and declared war on fire. From that humble beginning, the National Fire Protection Association was born and grew into the present world-wide, independent, technical and educational organization that it is today, with members in 37 countries. Global honor will be paid to the NFPA at its 50th Anniversary meeting in Boston, June 3 to 7, 1946. The Association's address is 60 Batterymarch St., Boston 10, Mass.

The National Fire Protection Association is the international clearing house for all information that is authoritative on the subject of fire protection and fire prevention. It has been a faithful servant of the industrial world. Non-commercial and non-profitmaking, the Association is supported by the dues of its members which number over 150 national organizations and more than 10,000 individuals. While 40% of members are industrial organizations and business leaders, its membership is open to any individual or organization interested in the protection of life or property by fire.

METAL CLEANING BY SOLVENT DEGREASING

(Continued from page 28)

is a factor of real importance, particularly in connection with vapor degreasing. Certain precautions must be followed in order to minimize the hazards to health and safety.

Since solvent vapors are toxic and can be injurious to the health of workers, adequate ventilation is needed to remove excess vapor. It is the hand operated tanks that more often endanger the health and safety of workers.

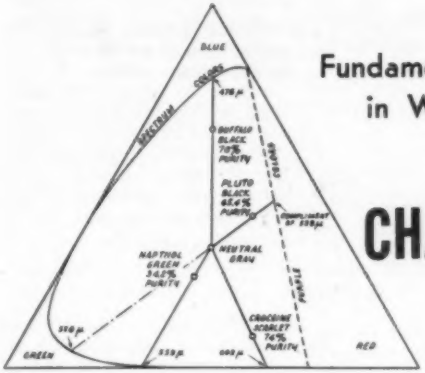
Careful handling of the liquid is also necessary, because skin troubles may result from frequent or prolonged contact with solvents. If skin contact with solvents cannot be avoided, then skin difficulties may be prevented by supplying workers with protective clothing, protective creams and adequate washing facilities. If these precautions are observed, metal cleaning may be safely carried on with solvent degreasing materials and equipment.

In a future article I will discuss solvent conservation and degreaser maintenance, two factors which affect production cleaning efficiency and operating economy.

W. H. S. O'Brien Rejoins the P. D. George Co.

Walter H. S. O'Brien has been released from special assignment with the United States Treasury and has rejoined The P. D. George Co., St. Louis 7, Mo., as Manager of Railway Paint Sales.

In 1943 Mr. O'Brien was asked to join the staff of the War Finance Division of the Treasury Department, where he served three years as executive officer of the Railroad Unit promoting sales of War Bonds to railroad employees in the United States.



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Chadeloid fundamental research has produced:

A. Non-Grain-Raising stain eliminating labor and material costs.

B. Gives dependable drying performance.

C. The stains penetrate deeply and deposit no excess coloring matter.

D. Stains give clarity and enrich the development of wood figure.

E. Uniform widely varying wood surfaces.

F. Match-in sap streaks and compensate for various mineral and color casts in lumber.

G. Effect almost instantaneous drying.

H. Provide combination stain and fillers, with Non-Grain-Raising stains as a base.

I. Chadeloid stains employ analines or dyes with organic solvents and buffering compounds without the disadvantages of water, bleeding, and extra finishing operations.

J. Chadeloid fundamental research is continuing to produce unique results for the industry.

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Patentees and Licensors

U. S. PATENTS — 1,877,748 — 1,898,247 — 1,930,768 — 1,977,345 — 2,000,120 — 2,000,121 2,044,770 — 2,093,424 — 2,105,984 — 2,161,503

CANADIAN PATENTS — 330,344 — 343,162 — 343,163

Random Comment on the Industrial Scene

(Continued from page 10)

will be devoted to all aspects of motor power. important experiments are to be conducted in the use of nuclear energy and electronic devices.

* * *

War in Textiles—It looks as if the battle of the century may turn out to be the struggle for domination of the textile market by cotton versus synthetic textiles. With over seven billion dollars invested in its industry, the National Cotton Council is getting ready to carry the fight to its competitors, with no holds barred.

"Cotton can defeat any competitor on today's horizon," declares Oscar Johnston, president of the Council, "provided it is given equality with that competitor in scientific support, sales pressure and production efficiency." This spokesman firmly believes that the day has come to renounce a passive attitude and take a firmly offensive course.

Even if the cotton industry should succeed in holding all its pre-war business, in addition it should succeed in attaining a large volume of exports, Johnston points out, it would still fall short of the requirements for prosperity in the years ahead.

* * *

Supplying Another War—In the opinion of many observers, the United States emerged from the recent conflict relatively a "have-not" nation. It has been pointed out by many competent authorities that our enormous use of petroleum, iron ore, and other strategic materials in World War II severely depleted our permanent stockpile.

This contention is borne out by a report of the Department of Interior, which shows that usable reserves of over 20 "blue chip" minerals in this country will probably not last another generation. The official analysis discloses that the United States consumed 36 billion dollars worth of minerals for making fighting weapons and in the processing of fuels.

* * *

Flying Auto — The oft-described dream of a vehicle which will fly in the air and navigate on the highway has already materialized. Southern Aircraft has developed an experimental two-seater with detachable wings. In the air, the machine attains a top speed of 128 miles per hour, with a range of over 300 miles.

When the vehicle is used as an automobile, the tail, wings and tailbooms are removed in one section, with the remainder serving as a three-wheeled automobile. The wheel control which is employed for steering on the ground is also used in the air.

* * *

For Visitors—Readers of *Industrial Finishing* may obtain free tickets to leading radio broadcasts upon request of this department. When planning a trip to New York, drop a line to: Lawrence H. Singer, New York Correspondent, 130 West 86th Street, New York 24, N. Y.

Among the cooperating sponsors are: Gulf Oil Co. ("We The People"); Kirkman and Son ("Can You Top This?"); B. F. Goodrich Co. ("Detect and Collect").

It's Tough—tougher than the ordinary lacquers!

Yes, here's a tough piece of goods, a lacquer finish that will meet the most critical requirements of postwar production. A nation hardened to bulldozers, tanks, battleships, monster planes and subs, will accept nothing less than a product finish that endures the elements, and the hardships of constant usage. Schaefer's Mar Proof Lacquer is a finish that cannot be marred or scratched. Made in either clear gloss rubbing or satin finish, it produces a splendid transparent coating of full depth on maple, walnut, gum, mahogany and other cabinet woods. Economical; gives plenty of coverage; dries quickly. Our Mar Proof Lacquer Sealer is recommended with it for a first-coater.

A Schaefer Mar Proof Lacquer finish will give you the best start in this reconversion period. Use this tough mar proof lacquer, and obtain satisfaction right away. Working samples furnished without obligation. Write for them!

THE SCHAEFER VARNISH COMPANY, INC.
Louisville, Kentucky

THUMB-NAIL IT!

Try to scratch or mar it! Cannot be marred or scratched!

Materials Supplies Equipment

"Minit Kote" Used in 2%, Not 27% Concentration

Referring to the published write-up about "Minit Kote" for cleaning and phosphatizing the surfaces of iron and steel products to be painted, (April, page 116), *Minit Kote may be used in a one-stage washer at a 2% volume concentration.* In the April article, the figure is incorrectly given as 27%.—*Klem Chemical Works.*

Duridine 210 B Prevents Rust

Duridine 210 B (the new name for 210 B Deoxidine) was selected by the American Chemical Paint Co., Ambler, Penna., as a more descriptive name for the distinctive characteristics of the product. It also eliminates the confusion which occurred, due to its functions differing from those dependable properties which characterize the original Deoxidines.

The thin, tight, relatively hard phosphate coating which is developed on metal surfaces, when cleaned with Duridine 210 B, prevents rust and provides an adequate surface to bind paint to the metal for an enduring lustrous finish.

Duridine 210 B will not remove rust, but *prevents rust from developing under paint, and also prevents rust from spreading under paint from metal exposed by deep scratches or other abrasions.* The Deoxidines are best known as rust removers, ruster inhibitors and cleaners. They leave a very lightly etched metal surface which affords good paint adhesion.

The Duridizing process is simple and well adapted for either small or large production plants. Three-stage washers suitable for alkali cleaning may be used. The process is easily controlled and produces uniformly good results. Duridizing produces a dependable paint retaining and protecting surface.

Conveyorized Work Table

What is claimed to be an all purpose conveyorized work table for assembly, inspection and packaging operations, is being offered by the Island Equipment Corp., 101 Park Ave., New York 17, N. Y. It can be assembled in as many units as may be desired; can be lengthened, shortened or moved. The conveying belt is powered by the company's well known Powerpac Unit.

"Brevon" Protective Coat Can be Peeled Off

The Zapon Division of Atlas Powder Co., Stamford, Conn., announces the development of a new product, "Brevon", an air-tight plastic covering that protects machines, equipment and other products which must endure long periods of exposure. Brevon, originally designed to protect Army and Navy materiel in all types of weather and during shipment, cov-

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STILLE-YOUNG *Chicago 14*

ers the surfaces with a tough, non-inflammable, anti-corrosion film that seals in the equipment and seals out the elements.

The new strippable covering is used on machine tools, equipment or anything else requiring protection during shipment, export or storage.

Brevon is applied by spraying. Objects with projecting parts are first covered with a lattice-work of tape strips over which Brevon webbing solution is applied, bridging gaps as wide as 16-in. in the webbing.

The covering has a life span of 20 years; it resists a tensile pull of 2,000 lbs. per square inch; it is flexible; provides low vapor transmission rate under high pressure; and retains all its qualities through a temperature range of 40° below zero to 200° F.

The company anticipates a wide market for this product in industry where packing protection is required, as in export shipments and extended storage.

Miskella Insulated Infra-Red Units

Miskella insulated infra-red units, for use in building up infra-red heat tunnels and ovens, are announced by The Miskella Infra-Red Co., E. 73rd & Grand Ave., Cleveland 4, Ohio. Units are 10¼-in. wide and range in length from 8¼-in. (for 4 lamps) to 35¾-in. (for 12 lamps). Distance from tip of lamp to back cover is 8-in. These units are equipped with adjustable focus springs for delicate adjustment of lamp filaments when needed. Units

A 4-lamp infra-red heat unit.

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can be furnished with or without lamps. Semi-gloss white porcelain enamel is the standard finish for the face of the unit.

When built into infra-red ovens the faces of these super-heat units become a continuous insulated reflective interior wall, while the backs become a continuous wall of single sheet steel painted gray. The wiring for maintenance and service is easily reached through the instant removal of any back cover.

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CORTLAND, N. Y.
"The Thinner Specialists"

Oakite Protective Oil Prevents Rust

Announcement of a new product for the prevention of rust on ferrous surfaces (iron and steel) between operations and while parts are in storage is made by Oakite Products, Inc., 32F Thames St., New York 6, N. Y. Known as Oakite Special Protective Oil, it has already found wide use in many plants where temporary or semi-permanent surface protection from rust is desired for parts or work, following such operations as grinding, machining, pickling, tumbling, sand blasting, brazing, etc.

Oakite Special Protective Oil imparts a thin, transparent, rust-preventive coating which does not stain or discolor ferrous surfaces. Parts to be rust-proofed may be immersed dry or, because of the water displacing properties of this Oakite special oil, may be immersed immediately after cleaning and rinsing, while they are wet, thereby eliminating the necessity for drying prior to applying rust-preventive.

In addition, finger prints or similar marks resulting from inspection or handling of machined work in process can be readily removed by adding 5% water to the special protective oil. A new 16-page booklet describing the many industrial applications of this product is available upon request.

F. G. Weed, New President of Rinshed-Mason Co.

Frederick G. Weed has been elected President and General Manager of Rinshed-Mason Co. (paints, enamels, varnishes and lacquers), Detroit, Mich. Mr. Weed succeeeds Herbert W. Mason who will serve as Chairman of the Board of Directors and Treasurer of the company. Mr. Weed has been associated with the paint industry for over 26 years. He joined Rinshed-Mason in 1925.

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Ideal for use where previously two or more coats have been applied. Has good adhesion on metal, wood, composition board, paper, etc.

Can be supplied in all colors—except clear.

Write for YOUR sample NOW.

Note: *When writing advise us what article is to be finished. Quality and type of finish required. Method of application. If possible —send sample of unfinished piece and sample of finish desired.*

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Booklets Catalogs Circulars

Catalog of Cleaning Compounds

A 24-page catalog of information regarding 39 different cleaning and drawing compounds is announced by Northwest Chemical Co., 9310 Roselawn, Detroit 4, Mich. Five general classifications of cleaners are covered, namely: 1) electrolytic, 2) immersion, 3) solvent, 4) spray and 5) water-wash compound for spray booths.

Fire Bulletin Gives Facts

Much interesting, timely and practical information appears, along with illustrations, in the March 1946 copy of Kidde Industry. It all relates to what can be done about preventing or quickly stopping fires where they occur most frequently and where they do maximum harm to industry. Write Walter Kidde & Co., Inc., 460 Main St., Belleville 9, N. J.

Colored Paper Labels Indicate Humidity

Eljay Enterprises, P. O. Box 891, Newark 1, N. J., announces a new and novel product known as "Hygrolabels"—small, sensitized labels that change color with humidity. The color change is distinct, definite and reversible. The color is a brilliant blue-green when dry, and pink when moisture, dampness or humidity approaches the point where mold, mildew, corrosion or rust takes place.

"Hygrolabels" are furnished in the form of self-adhering labels supplied in roll and strip form upon a protective backing. Individual labels may be placed on, in or between the material to be checked. By removing the label from the protective backing it may be affixed to any surface. By leaving the protective backing in place the label may be placed into any powdered, granulated or flaked material without contaminating product.

Blast Cleaning Catalog

Complete information on the new 60x96-in. Wheelabrator Tumblast appears in Catalog No. 264, published by American Foundry Equipment Co., 555 S. Byrkit St., Mishawaka, Ind. The largest machine of its kind ever built, this mammoth Tumblast has a capacity of 63-cu.ft. and will clean 6000-lbs. of steel castings in 15 minutes.

Detailed information on this machine, including installation photographs, construction features, overall dimension drawings and specifications appear in this 16-page catalog. General information and specifications on other Tumblasts in the American line are also included in this book.

Phosphate Coating Bulletin

An illustrated bulletin by the American Chemical Paint Co., Ambler, Penna., describes and illustrates Thermoil-Granodine, a process treatment that forms a phosphate coating on clean iron and steel products. This phospate coating serves as a protection against rust and it provides a highly protective and durable foundation for paint, lacquer and varnish finishes.

Technical Data Sheets on New Products

The American Chemical Paint Co., Ambler, Penna., has recently issued Technical Service Data Sheets on some of its new products for surface treatment and surface protection of metals.

One is about "Alodine", the process and chemicals used to produce a protective skin-like coating on aluminum and its alloys before the surfaces are painted. The Alodine treatment increases resistance to abrasion and corrosion on both painted and unpainted surfaces.

Another set of data sheets supplies complete information about "Duridine" for cleaning and phosphate-coating iron and steel parts in preparation for painting.

Heat-Resistant Finishes

Three folders that list and describe special clear and color coatings which will withstand high temperatures and resist corrosion, are available to those interested. Write Geo. R. Mowat Co., 21 W. 40th St., New York 18, N. Y.

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Particles finely cut, uniform — fluffy yet filling. ✓

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Editorial

Just Wait! You'll See Sharp Competition

★ Signs on the business scene are pointing increasingly to confirmation of an editorial observation made in these columns time and again during the past 12 months, to wit: Postwar competition promises to be stiff; stiffer than it has ever been. Underscoring this conclusion are the recent comments of two prominent executives.

Speaking before the Chicago Sales Executives Club, W. A. Matheson, manager of Williams Oil-O-Matic, sounded a warning that the time when selling again will be a tough job may come sooner than anticipated. He said:

"Personally, I know a man who has placed his order for an oil burner with five different dealers. That man does not intend to buy five oil burners. One of those good old American privileges is that of canceling an order. The gentleman in question will cancel four."

Mr. Matheson asserted that he would like to believe he had discovered the only man in the nation who has ordered five times what he intends to buy. "But something tells me there are others, countless others," continued the Williams Oil-O-Matic manager. "Discount those orders on your books, Mr. Planner. What you are feasting your èyes on may turn out to be only a mirage. Full speed ahead with your plans — selling plans. You see the 'passionate' purchaser is not only passionate; he is promiscuous as well.

"We are operating today under an economy of scarcity; a scarcity built up through more than 4½ years of limited production. We are operating at a time when the purchaser is bidding, and bidding high, for what we have to sell. We are selling at a time when selling is at its lowest premium. In the face of all of these conditions we

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NITROCELLULOSE LACQUER air dries in a hurry . . . eliminates costly baking . . . reduces delay between spraying and shipping . . . makes faster delivery a sales point for your product. A durable, easily applied coating, lacquer has been the welcome solution to many finishing problems and has brought important savings in time and cost. All these advantages can be yours. Ask your supplier.

CSC makes no lacquers or thinners but supplies solvents and plasticizers to manufacturers of protective coatings.

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are planning for a time when selling will become the toughest, hardest assignment that can be given to a man."

The other observer, William H. Schutt, president of William H. Schutt Associates, industrial engineers, Detroit, points out that "American business and industry will be faced with the keenest competition ever experienced for postwar market." This competition, he says, will be international in scope. *Only those manufacturers who are progressive and take advantage of their war production experience will be able to meet this competition successfully.*

What is the answer to competition? "Productivity," declares Schutt. "This can be accomplished in several ways, the most important of which are correct processing of the product, well-balanced plant layouts, and time study standards."

These, he says, reduce the cost of the product by increasing the productivity of each worker. Incentive systems that are workable, that are fair to both labor and management, also constitute a factor making for obtaining increased output.

"Productivity is the answer to both competition and maximum employment because, as the price of the product goes down, its market increases," Schutt concludes. With increased sales volume more men can be employed. This is how jobs are created.

Food for thought here for finishing executives.—A.P.S.

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Methods Check-up on Metal Cleaning Work

★ Mr. Executive, when you determine to begin a production check-up in search of possible places to make savings by cutting out needless waste, and increasing eflectiveness of your materials, methods, equipment and man power, *be sure to look into the conditioning of all metal surfaces in preparation for paint coatings.*

Check your equipment from "stem to stern" to make certain that it is operating at peak efficiency. If

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you use an alkali still-cleaning tank, for example, be sure that it is heated with the most efficient and economical medium available. See, too, that the tank is of sufficient capacity to handle the volume of work required at top production speed.

Also, provide for some agitation of the cleaning solution. This is not absolutely essential, but experience in many plants indicates that agitation is a definite aid to speedier, more effective, more economical removal of surface dirt, oil, grease, and all kinds of smudges. It may be accomplished in various ways. Vigorously boiling the solution is the simplest method. Installation of baffle plates in the tank, to produce convection currents, is still another practice commonly employed.

See that adequate rinsing facilities are provided. Rinse tanks, like cleaning tanks, should have an overflow dam to assure removal of oil films as they form.

Or, if you use pressure-washers to preclean parts, check the spray outlets and supply lines. If these are partially clogged or choked with foreign matter, remove these deposits so the machine can do its full cleaning action.

Again, if you are employing the vapor degreasing process, check over the degreaser carefully to make sure that avoidable solvent losses are stopped. Operate the equipment as the manufacturer recommends.

If you are blast-cleaning parts prior to painting, be sure to keep the abrasive clean through proper ventilation; this is especially important when metallic shot and grit are used. Sand, scale and fines have been known to retard cleaning speed by this method, as much as 50%. *(Continued p. 128)*

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From the materials standpoint, perhaps you may not be using the compound best suited for handling your particular work requirements. A cleaning agent used for degreasing steel, for instance, is often not satisfactory for cleaning aluminum or zinc; or, perhaps, a material that removes oil and grease effectively may have no similar action on buffing and polishing compounds.

These are only a few of the things that should be checked over if real efficiency and economy are to be obtained. There are many more which admittedly play an important part in securing peak cleaning performance. Cleaning equipment manufacturers and materials suppliers can give you a lot of help in this connection. That is why, in your quest for new economies, you will find it profitable to call in one of their trained service engineers and get the benefit of his suggestions.—T.U.S.

Meet to Discuss Mutual Problems

★ It has been a source of wonder to me as to whether or not it would be practical to arrange some kind of meeting where those concerned with finishing and finishing problems could gather, hear the wisdom of experts, ask questions of them, and discuss such mutual problems which will, without revealing any company secrets, help all concerned.

Nearly all technical groups seem to gather periodically for such purposes — platers, welders, etc.; why not those engaged in finishing? Certainly we can all use advice and suggestions from those more specifically posted in a given field. Surely we can gain valuable

information by listening to other men's ideas and problems.

With the reorganization of finishing departments now going on, with new people eager to learn how to do their jobs better, with new methods of handling and new materials on the horizon, such meetings seem to offer many advantages. The meetings could be held in a centrally located city and complete transcripts printed in the finishing periodicals.

Such gatherings cannot fail to help supplier and user alike. Such meetings would be in the progressive spirit of the land and age in which we live. What do you say, engineers, finishers, executives?—G. A. M.

Welcome All of Your Finish Salesmen

★ An industrial finishing salesman may call on from ten to 20 prospects daily—unless he becomes "tied up" on tests or individual accounts which require servicing. In calling on finishing material users, he is offering not only his own distinctive personality, experience and knowledge, but also the resources and power of his firm. Behind him is his sales manager and behind the sales manager is the factory and the chemists in the laboratory.

I am willing to gamble, and place long odds on it, that there is seldom a day goes by but what we finishing formen or purchasing agents no not shrug our shoulders and send back word that we are too busy to see a visiting salesman. In doing so we are often refusing an opportunity to find out something of interest and value.

Of course we may not buy from each and every salesman who calls

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The TABER ABRASER surface-tests . . . paint, textiles, leather, rubber, plastics, paper, metals, plating
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on us, yet by refusing each finishing material salesman at least a 10-minute interview, we are not only hurting our firm, but are also passing up the chance of learning something about how others are doing their finishing. If we get only one nebulous idea from his talk, and if it will aid us, isn't it time well spent?

The idea of dismissing salesmen with no hearing, having in mind only the fact that we will not buy his goods, is not only foolish but costly. If we listen courteously to him, discard what is non-essential, and retain what information of value he may give us, we are not only benefiting him but ourselves too.—C.D.Y.

Where Materials Are Needlessly Wasted

★ A few days ago I was discussing, with the president of a paint company, the raw material status, such as the procurement of oils. I was informed that the oil situation was somewhat critical and this information prompted me to write this article.

During the war-time period we were fully aware of the importance in the conservation of materials and the elimination of waste. With reconversion here, are we still as mindful of this important fact?

Today we must continue, as in the war-time days, to avoid carelessness, neglect, indifference and whatever else may result in needless waste of material. It is imperative that all precautions should be taken if the demand for materials and production is to be met. Furthermore, if we allow ourselves to overlook this fact, it is obvious that our costs will also increase.

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Three generations of wood finishers have used SAN-ITAI-RIE FILLER. It still is best for all defects in wood.
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product painting and finishing should be conscious of this fact and should be instructed to utilize every effort to prevent the waste of any materials or supplies. I suggest a periodical check-up of all operations where waste is apt to exist. Some of the common causes of waste are as follows:

1) Incorrect intermixture (thinner and paint). Viscosity readings should be in order to insure correct amount of reduction.

2) Careless mixing methods. Use proper mixing equipment.

3) Improper atomization of paint at the spray gun and incorrect air pressure.

4) Improper paint agitation.

5) Unclean containers.

6) The use of quart cups, where production is large enough for use of 5-gallon pressure tanks.

7) Improper temperature of paint storage and spray room. Maintain temperatures between 70° and 85° F.

8) Refinishing of work due to poor workmanship or poor housekeeping.

9) Incorrect or careless use of masking tape or masks.

10) Evaporation: Keep all containers covered when not in use.

In one plant I serviced recently I noticed that two to three coats of paint were being applied to parts where, because of the location of the part in the assembled machine, one coat of paint was sufficient. This resulted in a waste of labor as well as material.—C. RAYMOND SYER.

Industrial Fire Loss Excessively Heavy

★ Destructive fire is the silent partner of inflation. Scarcities of buildings, food and clothing are critically aggravated by our mounting fire loss, thus contributing to our dangerous inflationary spiral. The tragedy of this economic depletion of life and property by fire

is that well over 90% of all fires can be prevented by proven safety principles, requiring little time or money.

Large-loss fires (fires exceeding $50,000 loss) have skyrocketed 48% in the last three months in the United States and Canada. According to a regular quarterly survey of the National Fire Protection Association, 329 fires totalling $48,800,000 were reported to the NFPA from Dec. 7, 1945 to March 6, 1946, compared with 158 in the preceding three months. These 329 fires represent 32% of the estimated $151,045,000 loss for the 175,000 fires which occurred in the quarter ending March 1.

Eighteen percent or 60 of these 329 fires occurred in "multiple occupancy" buildings (two or more tenants conducting different enterprises); 47 fires hit manufacturing plants; 30, warehouses; 26, habitational building; and 22 were group fires involving two or more buildings. Other occupancies suffering repeated losses were: mercantile stores, 20 single stores in individual structures; schools, 15; mills and grain elevators, 11; churches, 10; garages, 10. Over 155 mercantile stores were destroyed in multiple occupancy and group fires, the heaviest losers being clothing and dry goods stores, hardware and appliance shops, food markets and restaurants.

In terms of dollar losses, group fires were most costly ($9,348,700); multiple building occupancy second ($8,114,850); manufacturing plants third ($7,761,800); warehouses fourth ($5,416,260); and mercantile stores fifth ($2,149,850).

NEW WAY to GET *More Profits* OUT OF EVERY SQUARE INCH of YOUR PLANT

Drastic space limitations need prove no obstacle to increased production and greater profits when it comes to finishing and conveying. Look how Jensen solved this problem at J & H Tool Company, manufacturers of coal shovels. Into a space of only 14' x 54' Jensen engineered a complete finishing system, including power washing machine, spray rinse compartment, floor-mounted infra-red oven for drying moisture, paint dip tank and ceiling-mounted infra-red paint-bake oven . . . all co-ordinated with loop-around conveyor. *Production!* 166 shovels per minute! *Write Jensen today!

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An analysis of the 329 fires shows that 98 fires started between midnight and 6 A. M.; 78 between 6 P. M. and midnight. Combined, this means that 176 fires occurred during periods of normal inactivity and darkness. 130 fires broke out during daylight hours (6 A. M. to 6 P. M.) when the human element was most active. In 23 cases the time of fire was not reported. (Total: 329.)

A casual analysis of the causes of these fires shows a disproportionate number of "Unknowns." Influencing this is the fact that about 65% of the fires resulted in total loss, thus destroying evidence. Fires caused by heating defects, electrical causes, and flammable liquids are high on the list.—*N. F. P. A.*

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Hilo Representatives in Eastern States

Released from the Navy after three years service, J. O. Smith, Jr., has resumed coverage of his Central Pennsylvania territory for the Hilo Varnish Corp., Brooklyn, N. Y. Smith entered the Navy in 1943 and had been assigned to several East Coast stations. During the last period of his service, he was stationed at the Naval Supply Depot, Williamsburg, Va. He returns to the Trade Sales force and will make his headquarters at Williamsport, Penn.

Fred Slader, Jr., of Lexington, Mass., has been appointed to the metropolitan Boston Trade Sales territory, succeeding the late Frank M. Hogarty. Before joining Hilo, Slader was connected with the sales department of the Crowell-Collier Publishing Co.

Classified Advertising

Rate: 50 cents per line per insertion—minimum $1.50

POSITION WANTED

As salesman. Have had four years' experience selling all types of finishing materials. Can service own accounts. Have no preference as to territory. Address IF-302, care Industrial Finishing.

POSITION WANTED

As Sales Representative with reliable paint and varnish company, covering New York, Pennsylvania or New Jersey with both wood and metal trade. Have good following in both. Address IF-303, care Industrial Finishing.

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With thorough knowledge of synthetics, lacquers, ovens and conveyor line spraying wanted by Ohio Company manufacturing dental equipment. Give production record, experience and desired salary in reply. Address IF-304, care Industrial Finishing.

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